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A Simple System for Procuring Cost Data

Details of the Routine Used by the National Tool Company—Narrow Width of Building a Special Feature of the New Plant

A simple and effective system has been adopted by the National Tool Company, Cleveland, Ohio, recently for keeping track of the cost of the work that passes through its shop and at the same time furnishing the office with a record of how every order has progressed in the shop. When a workman starts on a piece of work he is given an order sheet, Fig. 1, which follows along with the work and is filed away when the order leaves the shop so that it can be readily referred to when a similar order is received. When required a drawing of the tool is made in the blank space on the lower part of the order sheet. If the tool ordered requires more complete details a blue print accompanies the order. The sample order sheet shown is for a side milling cutter for which the specifications noted on the blank provide all the information needed by the workmen.

The time keeper gives the workman a time slip, Fig. 2, when he starts on an operation and stamps the time he begins the work on it. When the operation is finished the workman takes the slip back to the time keeper, who again stamps the time on it, so that the actual time required for an operation is shown. A check mark placed opposite the list of operations near the lower part of the blank shows what work a man did. When a workman is given a release on one piece of work by returning the slip and having the time stamped on it he is given a new time slip stamped for another piece of work. Thus a check is kept on a workman and he is not given an opportunity to waste time. On this slip there are also indicated the order number, workman's number and department. The slips are sent to the office twice a day and a girl enters them on the cost card, Fig. 3.

Orders as received are entered on a follow-up order card, Fig. 4, which has blanks to show the date of the various operations. To find how far a certain order has progressed reference is made to this card in a filing cabinet. A glance at this card will also show if a piece of work is being delayed too long in any department. These cards are tabulated from department receipts, Fig. 5 which workmen receive when they turn a piece of work over to the next department, these showing the time the work passed from one department to another. The follow-up order cards are provided in two colors, yellow for regular orders and red for rush orders, and separate cabinets are used for filing each class.

The cost card is complete record of the time spent on each order as it goes through the shop. The labor time entries are reduced to labor costs which are tabulated, thus giving the entire labor cost. To this item is added

the overhead charges and cost of material in blanks provided for that purpose and the footing is a total cost of the order. The projection at the top of the cost card is for convenience in locating an order in the filing cabinet. For example, the order numbers that end with a 3 are placed on a card having the figure 3 printed on the projection.

The New Factory Building

Some interesting and original ideas in factory design have been carried out in the new plant of this company. It was recently found necessary to provide new quarters that would afford it at least double its former capacity and a location was selected at Madison avenue and West 112th street near the outskirts of the city. The site acquired comprises about four acres. The property in that vicinity is not sufficiently high in price to induce a manufacturer to save on space by building upward instead of covering more ground space by one-story buildings. However, it was decided that for the purposes required better arrangements could be secured, economies in manufacture would be effected and a thoroughly modern plant could be devised at a lower cost by confining the factory to a limited ground space and making it three stories high.

One of the most interesting features of this plant is the fact that it is built very narrow in order to secure the maximum amount of outside light and at the same time making the interior columns unnecessary and leaving the entire floor space clear. The absence of a row of columns makes a saving of practically 5 ft. in floor space. The main building is 150 ft. long and 31½ ft. wide. With the exception of the space occupied by the pilasters the entire side walls are of glass, the windows extending from the top of the benches to the ceilings. The abundance of outside light that penetrates the narrow rooms undisturbed by columns makes the use of artificial lighting unnecessary at any time during daylight no matter how dark and cloudy a day it may be.

The company's products include milling cutters of all kinds, reamers, counter bores, gear cutters and hobs. As its products are small in size, the largest tool made seldom weighing more than 30 lb., the erection of a plant somewhat lighter in some particulars than would be required if its operation necessitated the handling of heavy material and the use of heavy machine tools was possible. However, its construction is very substantial throughout. No expense was spared in making the plant thoroughly up to date in every particular.

The plant is of brick, steel and reinforced concrete

QUANTITY	1	DATE ORDERED	Jan 24	ORDER NO.	15256
REWAY	3/32	STEEL	Victory	TEMPER	360
DRAWING					
2 3/4" x 3/8" x 1" x 3/8" x 1/4" x 1/8"					
22 x 65" x 76"					

Fig. 1—The Order Sheet Given to Each Workman with Every Job

THE NATIONAL TOOL COMPANY CLEVELAND - OHIO			
Department Receipt			
Date _____			
From _____		Dept. to _____ Dept.	
Quantity	Order No.	Quantity	Order No.
Signed _____			

Fig. 3—The Receipt Used When a Piece of Work is Transferred from One Department to Another

inal and interesting. The I-beams forming the girders are reinforced with concrete on each side up to 1 in. from the outside of the beam flange. This left a 1-in. flange on which are clamped 3-in. I-beams running lengthways. The hangers for the countershafts are bolted to plates that can be slipped along the small beams to any desired location and are slotted so that any size hanger can be used. The machine tool equipment is placed in four rows, two rows on either side, leaving a wide aisle in the center. The machinery is motor driven in groups. Instead of having belt or chain drive the lineshafts are geared directly to the motors, gears of similar size being used so that they are interchangeable. The benches along the side walls are 35 in. high and 23 in. wide. The front part of the bench is of maple and the back part of pine, 2 in. in thickness. The legs of the cast-iron bench supports are 2-in. gas pipe that is screwed into fittings that are fastened to the floor.

The plant is heated by cast-iron radiators hung from the walls under the benches, a 2-in. space being left between the benches and walls, to allow the heat to rise. A back on the benches 3 in. high prevents tools from falling back of them.

Artificial illumination is furnished by 100-watt Mazda lamps hung in three rows 9½ ft. from the floor and spaced about 10 ft. each way. These lamps are set in 18-in. reflectors. A few 250-watt lamps are also used. There are two switchboards in the center of the side wall on each floor to control the light and power circuits. All electric wiring is placed in conduits. At one end of each floor is a lavatory for the workmen. The wash bowls are provided with both hot and cold water. On the third floor is a restaurant for the workmen.

The shop is conveniently arranged for routing work through the different departments. On the first floor are located the grinding, stock and shipping departments and offices, on the second floor the milling department and tool-room and on the third floor the finishing department. The stock, which consists of steel bars, is stored in a nearly perpendicular position on wooden racks at one end of the first floor. There it is cut to lengths and taken in a 2-ton electric elevator at the end of the building to the turning department on the third floor. After being finished the work goes to the second floor for milling. From there it is sent to the hardening room that is located in a separate structure a few feet away from the main building. This building is 24 x 30 ft. and is equipped with one electric and six gas furnaces. After being hardened the tools go to the grinding room on the first floor for the finishing operations.

Adjoining the main building is a powerhouse equipped with a 125-hp. Erie City Iron Works boiler and a 100-kw. Westinghouse turbo-generator. The motors are driven by 220-volt, 60-cycle, three-phase alternating current. An interesting feature of the plant is the fact that the fuel for power, light and heat is furnished by the company's own natural gas well that is located only about 50 ft. from the main building. The gas is reduced to a 22-lb. pressure at the wellhouse and the pressure is further reduced to 8 oz. at the boiler room.

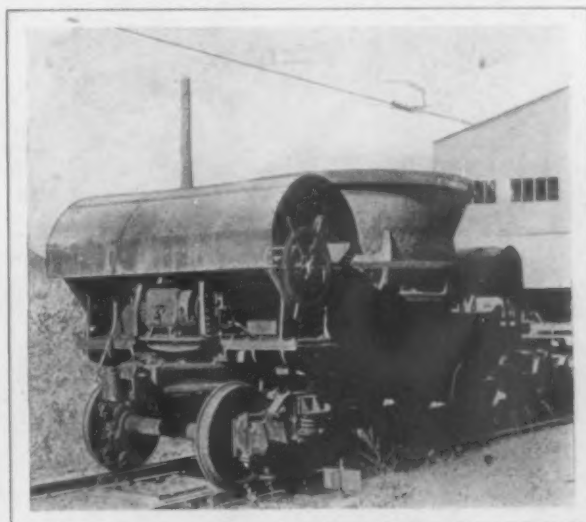
Pickands, Mather & Co., Cleveland, have sent out their iron ore analysis booklet for 1913, listing 10 old range Bessemer ores, 12 Mesaba ores, 13 old range non-Bessemer ores, 18 Mesaba non-Bessemer ores and 4 silicious ores.

Motor-Operated Slag Ladle and Charging Cars

As a substitute for the tilting of slag cars by compressed air in smelter work, cars tilted by an electric motor have been tried out at the plant of the International Smelting & Refining Company, Tooele, Utah. The advantages claimed for this scheme of operation are low cost, simplicity and reliability. The use of motors for this purpose does away with the large compressor ordinarily located on the locomotive and with forcing air through the main line which, it is pointed out, has sometimes been troublesome to maintain in an air tight condition.

The energy for operating the motor, which is a Westinghouse No. 6-K direct-current unit mounted on the end of the car and protected by a canopy, is obtained from the locomotive trolley. This motor is series wound and is entirely inclosed, thus making it both dust and weather proof. The power for tilting the car is transmitted through gearing to the tilting mechanism, and it is emphasized that the motor is designed to take care of heavy service of this character and to withstand the high temperature to which it is subjected.

Another use of electric motors in smelting work is in connection with charging cars at the lead department of the International Smelting & Refining Company. This car is driven by two Westinghouse No. 64 motors, mounted one on each truck, and the controller is located in a horizontal position at the end of the car. The motors and controller are designed in accordance with standard street railroad practice, but the motors are modified to suit the requirements of this special service, one of their most important characteristics being the ability to develop great power in a small space. Other characteristics of the motors which are built to reduce the amount of attention required



A New Type of Slag Car Which is Tilted by the Operation of an Electric Motor

to a minimum are reliability, ruggedness and ease of inspection. The lubricating system is simple and adequate for long periods of operation and excellent commutation has been secured by special design of brush-holders, commutators and bearings, so that these parts can be kept in service for long periods without requiring renewal.

The Sons of Vulcan, composed of part of the puddlers employed in bar iron mills in Pittsburgh and the West, are agitating among the membership for a new wage contract for the year commencing July 1. This organization secured a contract last year on a flat rate of \$6 a ton for puddling iron. At that time the rate was considerably above the sliding scale rate of the Amalgamated Association, but the price of bar iron advanced so rapidly that the Sons of Vulcan are now drawing 60c. a ton less than the other union and are much dissatisfied. The new scheme will provide for a daily wage rate, irrespective of how much iron the puddler produces. Manufacturers will strongly oppose the plan, as it would make their basis of cost of production uncertain, dependent entirely on the disposition of the puddlers to work.

Welfare Work in an Ohio Rolling Mill Town

Special Accident Relief by the Company— Good Housing and Other Methods of Securing Continuous Service of Unskilled Labor

The larger manufacturers of the country are beginning to realize the importance of looking more closely into the welfare of the ordinary laborer. In former years the unskilled workman was more migratory in his habits, and it is to the credit of employers, to a large extent, that this condition is changing.

In order to get and retain a full quota of workmen, who naturally would be more efficient when contented, the American Rolling Mill Company, Middletown, Ohio, has carried on extensive experimental work, some of which has covered a period of years and may therefore be said to be a part of the established policy of the company. The American Rolling Mill Mutual Benefit Association, for example, has now been in existence over 10 years.

labor by reason of sickness or accident. No benefits are paid for the first week's disability. In case of death resulting from accident or sickness, a sum of not less than \$100 is allowed for funeral and other expenses.

Special Accident Compensation

In addition to the benefits above mentioned, the company has independently provided a special accident fund that covers only accidents that result fatally. The amount paid to dependents is regulated by the size of the deceased employee's family and the years of his service as follows:

The sum of \$350 is paid to the widow, mother or sister, if dependent, of any employee who has been in the service



Fig. 1—The "Armco" Club Rooms for Foreign Workmen at Middletown, Ohio. Reading Room Extends to the Left

Varying degrees of success have attended the efforts of manufacturing companies in maintaining systems of insurance for their employees. Definite evidence of the merit of the plan adopted at Middletown is the fact that over 90 per cent. of the company's employees are members of the insurance association. The object of the association is stated in one of the articles of its constitution and by-laws, as follows:

"To afford relief to any of its members, who, while in the active and *bona fide* employ of the American Rolling Mill Company, may accidentally become injured, or through sickness be rendered incapable of attending to or performing their duty, and to enable them to avoid the necessity of appealing for aid, when so disabled, by collection from their fellow workmen; also to promote the general welfare of its members and bring the workmen of the various departments into closer relationship with one another."

A fee of \$1 is charged to cover membership registration and the first month's dues, and 50 cents per month thereafter. The benefits derived cover a payment of \$6 per week, for a period not to exceed 39 weeks, to any member in good standing, when unable to perform his manual

of the company one year or more. To this sum is added 20 per cent. of the principal for each child under 10 years of age; 15 per cent. for those between 10 and 15 years of age, and 10 per cent. for those between 15 and 18 years of age. Also, for every year the employee has been in the service of the company \$50 is added to the principal sum of \$350. Thus the total paid by the company and the benefit association on the accidental death of a workman without children who had been in the employ of the company for a period of 10 years would be \$950; and if a 10-year employee left six children under 10 years of age, the amount of the death benefit would be increased to \$1,370.

In accepting this special death benefit, the deceased employee's relatives waive no legal claims against the company, but simply sign a receipt for the amount. It has been found expedient in some cases to invest the amount due, in order to safeguard the interests of the heirs, who may not be capable of properly handling the funds; this is done through a special committee appointed to investigate each case.

Only one-half of the above-named amount of the special death accident benefit is given to foreign-born men,

who have not become citizens of the United States. This proviso has been added to induce foreign workmen to take out naturalization papers, and not return to their native countries after accumulating a little surplus money.

One of the company's principal troubles when starting out was the question of housing its employees, especially the foreigners, and their families. A. K. Lewis, an expert in such matters, having had several years' experience with different steel companies, was called in and the results of his work will doubtless interest manufacturers in other localities where both American-born and foreign labor is employed.

A number of cottages and larger dwelling houses were built on the company's property near the plant, and these were rented at a nominal rate to workmen, with the understanding that they were to be kept in sanitary condition. Each house is supplied with running water and the majority of them have sanitary plumbing. For the past two years, as an encouragement to the occupants

suits have been obtained in better living conditions that are simply marvelous.

Club for Foreign Workmen

Another special work has been more recently started in the opening of club rooms that are strictly for the use



Fig. 2—Roomy Yards in Workmen's Section



Fig. 3—American Rolling Mill Company Workmen's Houses

of these homes to improve their living conditions, the company gives out each month 12 prizes of \$1 each for the best kept houses. The small cost of this does not begin to offset the benefit derived in the better care of the company's property, as by stirring up a good-natured rivalry between the women members of this foreign colony, re-

of the foreign workmen. These rooms, of which a view is given, are comfortably furnished and are kept open from 8 a. m. until 10 p. m. No "red tape" regulations are in force, and the accompanying rules are the only ones that have to be lived up to by the members.

The secretary of the club is a linguist, and in addition to his club duties he acts as assistant to the construction department engineer, as well as general adviser to the foreign colony. His duties are numerous and varied, and in many instances he is called in to settle family disputes.

One particular feature that attracts members to the Arceo Club is the large number of foreign newspapers subscribed for by the company, that are placed on file in the club rooms. Stationery is also furnished free and a writing room is provided.

A bonus system for laborers is another new idea that was put in force recently, whereby every man working at general labor, who has been in the continuous employ of the company for one year or more, receives an increase



Fig. 4—A Typical Street with Company Dwellings

Rules

1. Only men with membership cards will be admitted to the club rooms, unless by special permission.
 2. Any one bringing beer or whiskey on the premises or who gambles for money there will have his membership card taken away from him.
 3. Any one who is intoxicated will not be admitted and any one presenting himself at the club rooms the second time in an intoxicated condition will have his membership card taken away from him.
 4. Any one refusing to do his share of the work in caring for the club rooms, etc., as directed by the club's captain, will have his membership card taken away from him.
- This club is for MEN, but if the members desire to use the rooms for any assembly purposes or to occasionally give a party, permission will be granted.

Permission must be obtained, however, before the rooms can be so used.

of one cent an hour over the general rate paid for common labor, and every laborer who has worked two years or more continuously receives an increase of two cents an hour over the regular rate. To illustrate this plan: A man who should work 25 days of 10 hours each in a month, and who had been in the employ of the company a year, would receive a bonus of \$2.50 every month; in the year following his bonus would be \$5 a month. In other words, if a man was started at 18½ cents an hour, the second year he would receive 19½ cents and the third year 20½ cents an hour.

By this method the faithful and steady men, if for any reason they should not be promoted to some job paying a higher rate, would still be rewarded and receive more than those who drift about and stay at each place only a short time. This system is intended to eliminate "floaters," who often quit a job just at the time when they are getting proficient and are most needed. The company has found that even in such tasks as the unloading and sorting of scrap iron, a workman with experience is worth more than a green hand. Undoubtedly the experience of manufacturers in handling laborers in every line of work tallies with this, furnishing the reason for the more general adoption of measures like those devised at Middletown to secure continuity in the service of so-called common labor.

Hydraulic Transmission Truck Hauls 45 Tons

Another remarkable trailer haul was recently made by the LaFrance hydraulic truck. A frame for the door of the new vaults which are being put in the bank clearing house of New York City had to be moved through the streets of New York. This frame, which was made by the York Safe & Lock Company, was delivered at pier 11, East River. It was placed on a four-wheel wagon which, empty, weighed 16,400 lb. The frame was 7½ ft. wide, 9 ft. long and 3½ ft. thick and weighed 52,600 lb. The hydraulic truck was loaded with five steel plates for the vault, which weighed 12,100 lb. The truck itself weighs 4½ tons, so that the total load to be moved was 90,100 lb.

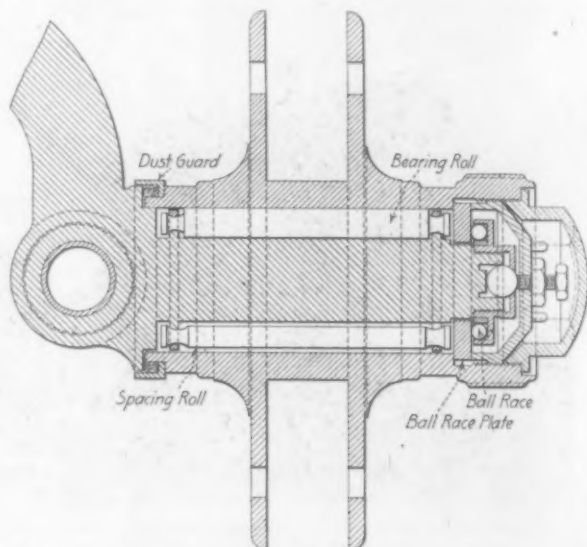
The shortest way to deliver this load to its destination would have been through Wall street, but permission to use that street was denied on the ground that the paving would not support the load. Therefore the truck had to proceed in a roundabout way via Broadway to Cedar street. Two horses were hitched to the pole of the truck to keep the trailer steered right. A grade of 4½ per cent. was met on Broadway. To show the tractive effort, the truck was stopped with its load on this grade, but had no difficulty in starting again. The draw-bar pull required to start this load and keep it moving on this hill was, it is stated, a little over 9000 lb. This demonstration, it is felt, illustrated how the hydraulic transmission is capable of exerting a tremendous draw-bar pull at starting and at low speeds. The speed at which the load was hauled was 4 miles per hour. It is estimated that it would have taken at least 20 horses to do the job, and they would probably have not moved over 2½ miles an hour.

The American Roller Bearing with End Thrust

In *The Iron Age* of December 12, 1912, was described the roller bearing developed by the American Roller Bearing Company, Farmers' Bank Building, Pittsburgh. In particular the features of the form of bearing applicable to use on pulleys and shafting was then taken up. In the accompanying illustration is shown the form for use with vehicles, together with an end thrust feature.

The drawing shows particularly the two sizes of rollers employed in the bearing, one set, the larger in diameter, carrying the load and forming the roller bearing proper, and the other, of smaller diameter, alternating with the bearing rollers and serving as separators for spacers. The details were mentioned at some length in the article referred to. At the right of the drawing may be seen the arrangement for end thrust, involving a circle of balls, with the arrangement indicated for minimizing end play, when, for example, there may be little or no end thrust at all. The bearings are designed, as has already been stated, for use with no lubrication, the feature being that there is no sliding contact, but one of rolling instead.

A number of interesting facts have been collected by the company bearing on the use to which the bearings have been put, and included among these is the performance of a locomotive bearing, which ran more than 20,000 miles on the Pennsylvania Railroad, sometimes as fast as 70 miles an hour, and it is stated that the Pennsylvania Railroad Company in its shops at Olean, N. Y., is using



The New American Roller Bearing Having Provision for Resisting End Thrust

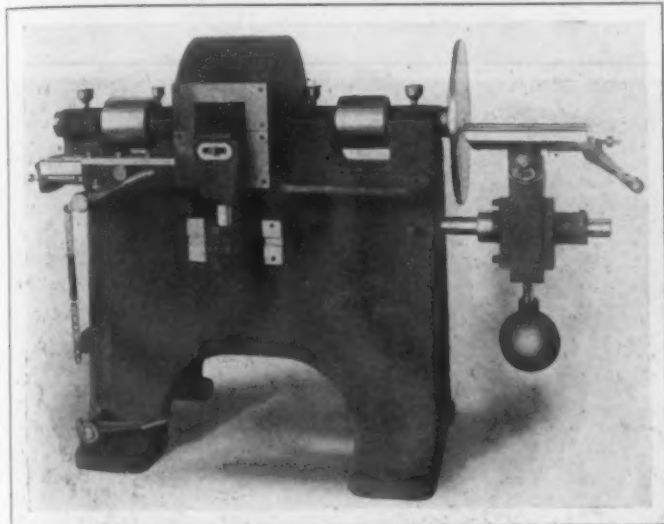
the bearings in a Sturtevant blast fan making 2400 r.p.m. without stop for 22 hr. a day. At last accounts, the bearings had run three years without oil, grease or any other kind of lubricant.

Machine Tool Exhibits at the Foundrymen's Chicago Convention

The Foundry & Machine Exhibition Company, C. E. Hoyt, secretary, Chicago, is not yet prepared to allot space for the foundry exhibition to be held at Chicago in October. A large number of reservations have been made, however, particularly interesting among them being the space requested by a number of machine tool builders. It is proposed to have such a representation of machine tools as will permit the display of a completely equipped machine shop. In commenting upon the special interest which the machine tool builders are taking in this exhibit, Alfred Marshall, of Marshall & Huschart Machinery Company, Chicago, stated that not only did the foundries offer a wide market for the sale of machine tools, but more important than that was the opportunity for illustrating to foundrymen the best methods for machining castings. It was pointed out that no greater opportunity for manufacturing economy is presented than in the development of a co-operation between the foundry and the machine shop, so that rough castings when received will require only the minimum and most easily accomplished machining.

New Disk Grinding Machine with Three Wheels

One of the most recent products of the Gardner Machine Company, Beloit, Wis., is a disk grinding machine which has three steel wheels 18 in. in diameter. This machine, which is designated by the builder as its No. 120 combination disk grinding machine, is claimed to be the heaviest and most rigid one built in the double-spindle



A Recently Developed Three-Wheel Disk Grinding Machine of the Double-Spindle Type

type with a capacity of 18 in. The arrangement of the wheels, one at the right end and a pair in the center, enables the surface of a piece to be ground on one side, while the double wheel can be used for grinding the two parallel sides of a piece simultaneously.

The right end of the machine has a rockershaft and a universal lever feed work table of the builder's standard type, and this construction in conjunction with a single disk wheel is employed for grinding one surface at a time. For simultaneously grinding the two parallel sides of a piece the pair of wheels in the center is used, the right one remaining in a fixed position, while the left hand one

enabled to produce duplicate pieces easily and accurately. The backward travel of the head, which need only be sufficient to release the piece from between the wheels, is regulated by an adjustable back stop. It is emphasized that this device is of importance in grinding thin pieces, since if the opening were too large there would be a tendency for the work to be caught between the wheel and the work rest. In applying pressure to pieces ground by the central pair of wheels either the foot or the hand can be used, since the hand lever shaft is connected to the foot lever shaft, or both can be used, if desired. A coil spring assists in the backward travel of the head.

Babbitt metal finished by boring, reaming and scraping is used for the bearings which are lubricated by compression grease cups. The end thrust on the spindle of the movable head is in one direction and is taken on hardened and ground steel thrust collars, means being provided to take up any end play so that if the spindle should heat and elongate it will loosen instead of sticking. The spindle construction in the right or stationary head is the same except that here provision is made for resisting thrust in both directions.

The equipment furnished with each machine includes different widths of work rests and there is a cast-iron dust hood hinged at the back, which completely covers the pair of wheels at the center. Sheet metal slides are employed for varying the size of the front opening in the hood. If desired abrasive ring wheels held in chucks can be used on this machine in place of the disk wheels, and in such cases a water attachment consisting of a pump and the necessary connections is furnished. This machine can also be furnished in what is known as the plain type, in which case the disk wheel, rockershaft and work table at the right are omitted.

New Face and Barrel Cam Cutting Fixtures

For cutting cams where the quantity is not sufficiently large to render the purchase of a cam cutting machine a profitable investment, the Garvin Machine Company, Spring and Varick streets, New York City, has developed two types of cam cutting fixtures. These are designed to make

Two New Fixtures Designed to Enable Barrel and Face Cams to Be Cut in a Milling Machine

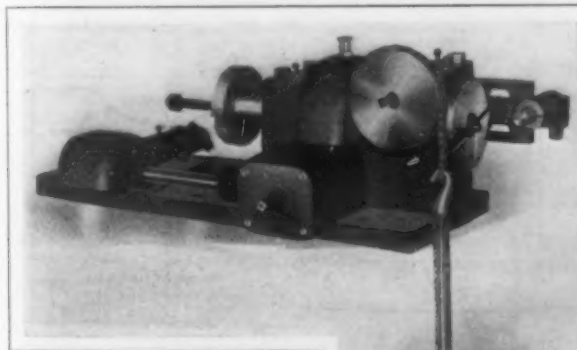


Fig. 1—Barrel Cam Cutting Fixture

is mounted on a spindle in a movable head which is mounted in a planed way on the machine base and is adjusted toward and away from its mate by a rack fastened to the underside that engages with a gear on the hand lever shaft.

This arrangement, it is pointed out, permits pressure to be obtained as well as enabling parallel pieces of varying widths to be finished, and the fact that the entire head moves instead of only the spindle gives a more accurate and larger output, due to the rigidity of the design. A finely threaded stop screw which is graduated in thousandths of an inch regulates the forward travel of the head, and when this screw is once set the operator is

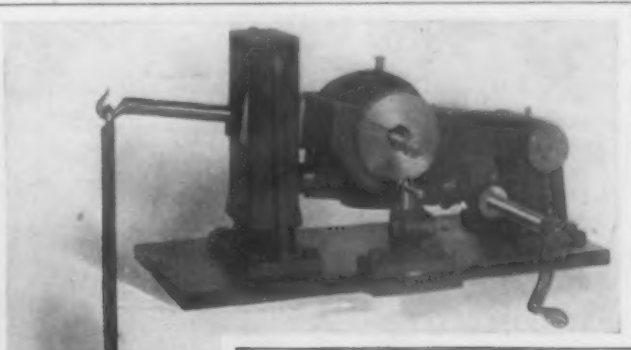


Fig. 2—Attachment for Cutting Face Cams

profitable the cutting of either face or barrel cams in an ordinary milling machine. Fig. 1 is a view of the attachment for cutting barrel cams, while that for the cutting of face cams is illustrated in Fig. 2.

The design of these attachments is such that they will fit any standard knee type of milling machine readily. Power feed is provided, and as the attachments are of the reversible design, the universal feed joints can be brought to the attachment, either from the front or rear of the milling machine frame, depending upon which is the more convenient arrangement. The smallest size of cam which can be cut by either of the fixtures is $1\frac{1}{2}$ in., and the largest is 6 in. The boxed shipping weight is approximately 225 lbs.

A Roller Ramming Molding Machine

Effective Where Draft Is Not Too Deep
—Mechanism for Pattern Plates

The Macdonald roller ramming molding machine, which has some features of very recent design, is being made by the Sneed & Co. Iron Works, Jersey City, N. J. The machine was developed in the foundry of that company because its requirements for castings for library book-stacks and ornamental iron work demanded a higher grade of work produced at lower cost than was possible under other methods. The maker of the machine suggests that it will bring back to the iron foundry many articles that have drifted to rolled and riveted steel, drop forgings, etc.

As the illustrations show, the machine consists briefly of a pattern drawing device, which may be of the split pattern or stripping plate type, a suitable roll for ramming the sand, angle tracks on which the roll runs, which also serve to confine the sand sideways, and a strike-off of special periphery, suited to each type of pattern, preceding the roll, the purpose being to profile the sand to secure uniform ramming throughout the mold. A dumping box is also provided, open on one side and having a coarse mesh wire screen over the top. The flasks are barred, both cope and drag. No bottom boards are used, and the molds are laid on a level sand bed.

After the work has been poured the copes are lifted off with the sand in them and piled on one side, the sand being tempered by throwing water over it as the flasks are handled. The castings are removed from the drags, which are left lying in their place on the floor. When the molding process is begun the drags are lifted up by means of

a yoke, having hooks adapted to engage the holes in the ends of the flasks and shapen out through the screen in the dumping box. The flask is then placed in position over the pattern and the angle iron tracks swung over so as to lie on top of the flask, and facing sand riddled on. The dumping box is lifted up by the crane and its contents emptied directly into the flask, the sand being retained by the angle tracks. The roll is then reciprocated two or three times over the flask, thereby ramming the sand. The



Fig. 1—Macdonald Molding Machine, 15 Ft. x 30 In. for Making Textile Castings, Set Up for Testing. The Flask has Been Put in Place Over the Pattern, the Sand Dumped on Between the Rails with the Dumping Box, and the Operator Is Ready to Start the Roll Forward by the Hand Lever Control. In Front of Him May Be Seen the Lever Controlling the Motor Which Draws the Pattern and Vibrates It

tracks are thrown back, the surplus sand struck off, the pattern drawn and the half mold lifted up by the crane and placed in position on the floor. The copes are similarly treated. The photographs show a machine on the testing floor, which was built for a textile machinery foundry, the

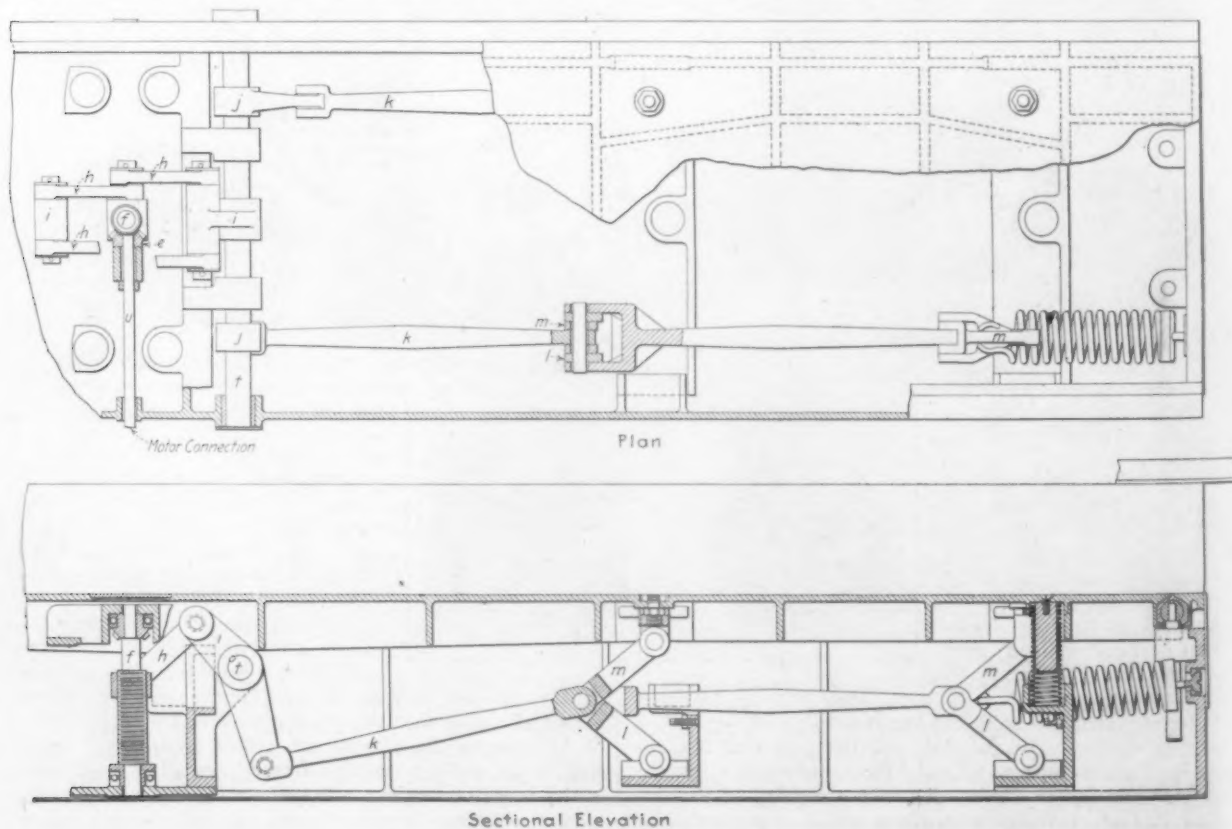


Fig. 2—Part Plan and Section of the Pattern Drawing Machine, Showing Method of Moving the Table and the Counter Balancing Springs

flasks used being 15 ft. long, 30 in. wide and 7 in. deep, cope and drag. While the usual type of stripping plate pattern can be employed, it has been found that with this type of apparatus split patterns can be used for most classes of work.

Raising and Lowering the Pattern Plate

The pattern drawing machine is operated by means of an electric motor, controlled through an automatic starter and an operator's switch, which can be seen just in front

trunnions on the side which are connected through link *h* to short crank arms *i* on the rocker shafts. The spindle is turned by bevel gearing *e* connected by the shaft *u* with a worm gear reducer which is driven by an electric motor. It will be seen that when the pattern is in its upper position both the vertical toggle links are straight, and that the connecting rods *k* with the crank arms *j* on the rocker shaft form another toggle which is also practically straight. By this combination the initial movement of the pattern as it leaves the sand is very slow, increasing rapidly toward its downmost position. It has been found that in flasks of such large area dropping the pattern suddenly will often result in pulling the sand from the flask through suction. The extremely slow movement prevents this and enables the use of split patterns where stripping plates would be ordinarily required.

Plaster of Paris Pattern

As no hand ramming is employed and as the roll never comes near the patterns, the patterns can be constructed of cheaper materials than is usually the case. The makers have found that plaster of paris patterns answer for making thousands of molds without serious deterioration. Another point about the pattern drawing machine is that the working parts are completely inclosed, the frame of the machine being a large casting having doors at the sides and ends to permit access to the interior to adjust the height of the pattern plate, to oil the mechanism, etc.

Vertical and horizontal counterbalancing springs are employed to aid in carrying the weight of the pattern table and pattern, and thus the load on the operating mechanism is reduced to a minimum. The parts are so arranged that all shafts have an equal torsion and there is no tendency of the operating mechanism to drag the pattern plate in any direction.

Adjustment for Varying Thickness of Patterns

Adjustment is provided to locate the height of the table to suit variations in thickness of the patterns, and the guide pins are connected with the plate by a ball and socket joint so that the plate can be slightly tilted without caus-

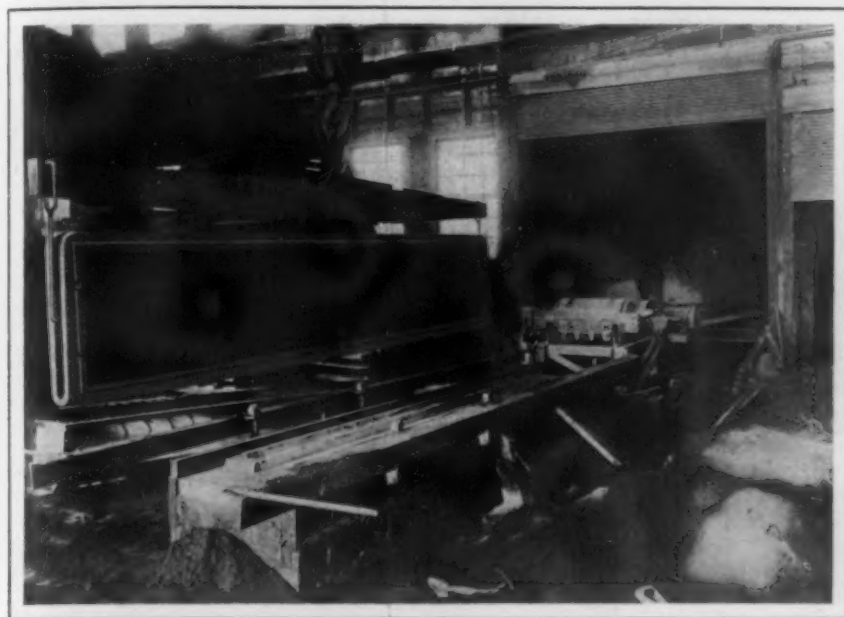


Fig. 3—A Mold Lifted Off from the Machine After the Pattern Has Been Drawn. This Class of Work Is Usually Done with Stripping Plates. Note the Special Projections on the Strike-Off to Remove Surplus Sand Above the Top of These Long Deep Ribs

of the workman in Fig. 1. Throwing this switch to one side drops the pattern, and the electric circuit is automatically broken when the pattern reaches its extreme low position. Reversing this switch returns the pattern to its initial position, where an automatic stop is also provided. Referring to the line drawing, it will be seen that the plate on which the patterns are carried is raised and lowered by means of vertical toggle links *l* and *m*, which are actuated by connecting rods *k*, joined to crank arms *j* on the parallel rocker shafts *t*, running crosswise near the middle of the machine. Between these rocker shafts is a vertical threaded spindle, *f*, on which runs a bronze nut, *g*, having

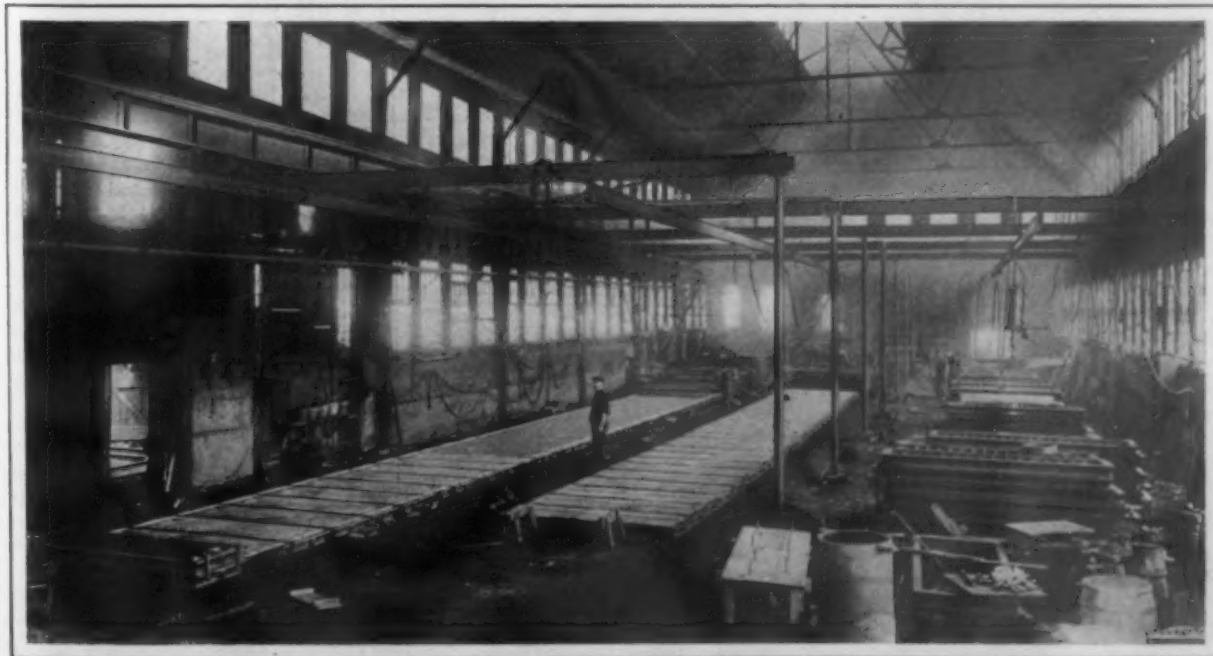


Fig. 4—View in the Sneed Foundry, Giving an Idea of the Capacity of the Macdonald Molding Machine. The Picture Was Taken at 10:40 A. M., Work Having Commenced at 7. Each Floor Is Manned by Two Handy Men

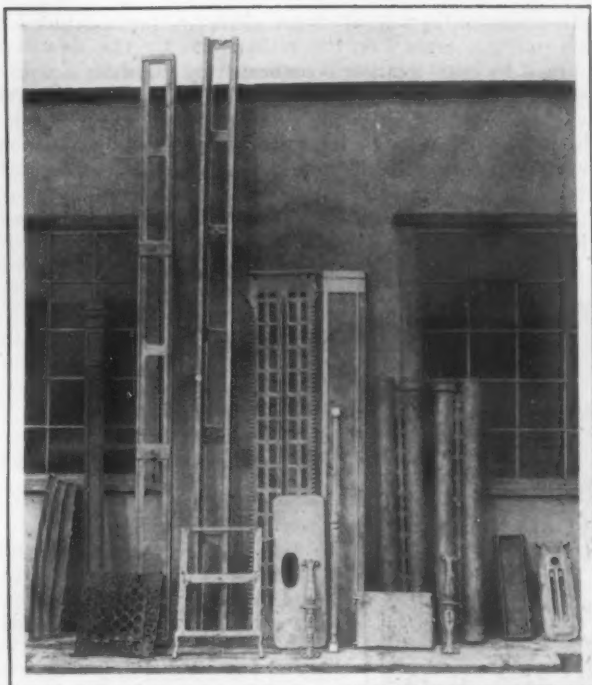


Fig. 5—Castings Made on the Macdonald Molding Machine

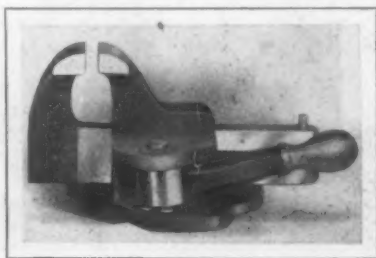
ing the pins to bind in the guides. Attached to the machine is a vibrator which is operated by the same motor that draws the pattern so that action is simultaneous and the operator does not have to turn on the usual pneumatic vibrator. The roll which performs the ramming operation is moved over the flask by a long arm composed of steel channels having pins riveted through them to form a rack and driven by spur gearing. Spring bumpers are provided to stop the roll at its extremes of travel, and automatic reversing and stopping mechanism is provided for the motor which may also be controlled by the operator at any point of its travel.

The machines are especially adapted to architectural castings, soil pipe, radiators, stove plate, school and theatre seats, piano plates, pipe fittings, lock castings, car castings, and any work that has not too deep draft. The makers find it advantageous to put a large number of duplicate patterns on one board and mold in multiple. In some cases they have as many as 220 patterns on one board. As the flasks are handled by overhead hoist it takes comparatively little more manual work to ram up and lay down a big flask with a large number of molds in it than to lay down a smaller flask by hand with only a fraction of the molds. Soil pipe manufacturers estimate that one machine is capable of turning out from 100 to 120 flasks per day, each flask containing four 4-in. soil pipe. In the makers' own shops two ordinary men on each machine put up 30 to 40 flasks per day 8 ft. long and 30 in. wide. Some of the patterns used by Sneed are highly ornamental, and the machine will reproduce intricate designs with great fidelity.

A Quick-Acting Lever Bench Vise

An improved type of quick-acting lever vise has been recently brought out by Fisher & Norris, Trenton, N. J. The locking device is the principal improvement in it, and the advantage claimed for the arrangement is quick action combined with powerful holding qualities. Among the fields for which the vise is designed to be used are the manufacture and repair of automobiles, private garages and general machine shop work.

The gripping power of the vise consists of a combination wedge and toggle motion



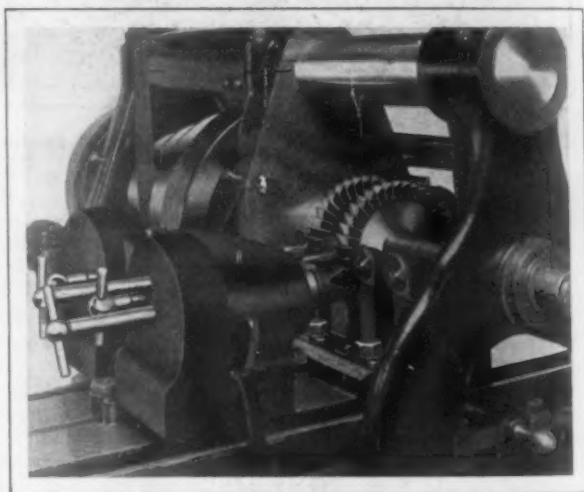
The Fisher Quick-Acting Lever Vise for Use in Shops of All Kinds

and it is pointed out that the grip does not depend on friction but is positive, being actuated by a rack and rack piece which are made of tool steel with true machine cut teeth. In operating the vise when the lever is thrown all the way back, the sliding jaw can be moved in or out at will. After the work is inserted between the jaws, the movable one is closed against the work by a slight pressure of the thumb against the stop pin in the end of the sword, while the lever with the hand already resting upon it is brought forward and grips the work so that it cannot be released until the lever is thrown back. The vise can be used equally well for either filing or chipping.

File-cut cast tool steel is employed for facing the jaws and the body is made of gunmetal. The vise is made in five sizes with both plain and swivel bases. The width of jaw in the smallest size is $2\frac{3}{4}$ in. and the opening is 3 in., while in the largest size the jaws are $6\frac{1}{2}$ in. wide and will open to maximum width of 11 in.

A New Application of the Fluting Machine

By the use of a special tail fixture having offset center disks, the Bickford Machine Company, Greenfield, Mass., has made it possible to square taps and reamers in its automatic fluting machine which was illustrated in *The Iron Age*, January 25, 1912. These disks grip the shank end of the tap, the other end being held by a special driving dog which has sharp, inwardly projecting corners. These grip the work firmly and are tightened up by the T-handle screws which are shown in the accompanying



View of an Automatic Fluting Machine, Showing a New Fixture Designed to Enable Taps and Reamers to Be Squared in the One Machine

engraving projecting through the gear guard of the head center block. The special advantage claimed for squaring work of this nature on centers is that absolute uniformity of the corners is secured, only one side being squared at a time. Four pieces can, of course, be squared simultaneously, and as the machine is fully automatic with respect to the table return and the indexing of the centers, an economical production is secured.

Although it is possible to handle four pieces simultaneously, for the sake of clearness only two cutters are shown in position in the accompanying engraving, the other two having been omitted to show the tail fixture and the method of attaching the center disks. These disks are reversible on the fixture which is arranged so as to be attached to the machine table in two positions. In this way the center point of the center disk will line up with the head spindle, irrespective of the way the disk is put on, and it is also possible to use both sides of the squaring cutters. With the machine illustrated it is possible to flute and square taps and reamers up to a maximum diameter of 2 in.

The Kerr Turbine Company, Wellsville, N. Y., manufacturer of the Economy steam turbine, has appointed F. A. Mazzur & Co., 141 Milk street, Boston, as its New England representative.

New Electric Grinding Machines

An Extensive Line of Portable Machines
for Use on Direct-Current Circuits

A new line of electrically-operated portable grinding machines has been brought out by the Van Dorn & Dutton Company, Cleveland, Ohio, as an addition to the products of its portable tool department which include electrically operated portable drilling and reaming machines. This line consists of five types of machines equipped with 1/3-hp. motors for operating on either 110 or 220 volt direct-current circuits at a speed of 4500 r.p.m. The special features of the machines are simplicity of construction, durability and ability to withstand hard service. The machines are made in the bench, tool post and aerial types which are shown in Figs. 1, 2 and 3 respectively, while the extended aerial type is illustrated in Fig. 4.

In the construction of these machines, all parts are gauged and are readily interchangeable. Form-wound armatures are used, the windings and material employed

a poppet pin and turning the housing one or more notches, each of which represents an adjustment of 0.0005 in. The journals are finished by grinding to provide a smooth wearing surface, and the oil chambers are cast integral with the motor housing. Self feed is provided, and the cups require refilling only at intervals, which is easily accomplished by grease port screws. Two felt wipers run lengthwise of the bearings and distribute the oil evenly, and felt washers at either end prevent it from running out.

The bench type of machine which is illustrated in Fig. 1 is designed for grinding small tools and generally for foundry, machine shop and boiler shop work, as well as for buffing and polishing. The tool post grinding machine, shown in Fig. 2, is intended for doing either external or internal grinding on lathes, tool grinding on milling machines and surface grinding on planing and shaping machines. An internal grinding attachment is furnished with this type. The aerial type, which is illustrated in Fig. 3, has adjustable handles so that they can be placed in any position. It is made with end handles and also with end and body handles for general grinding, buffing and pol-

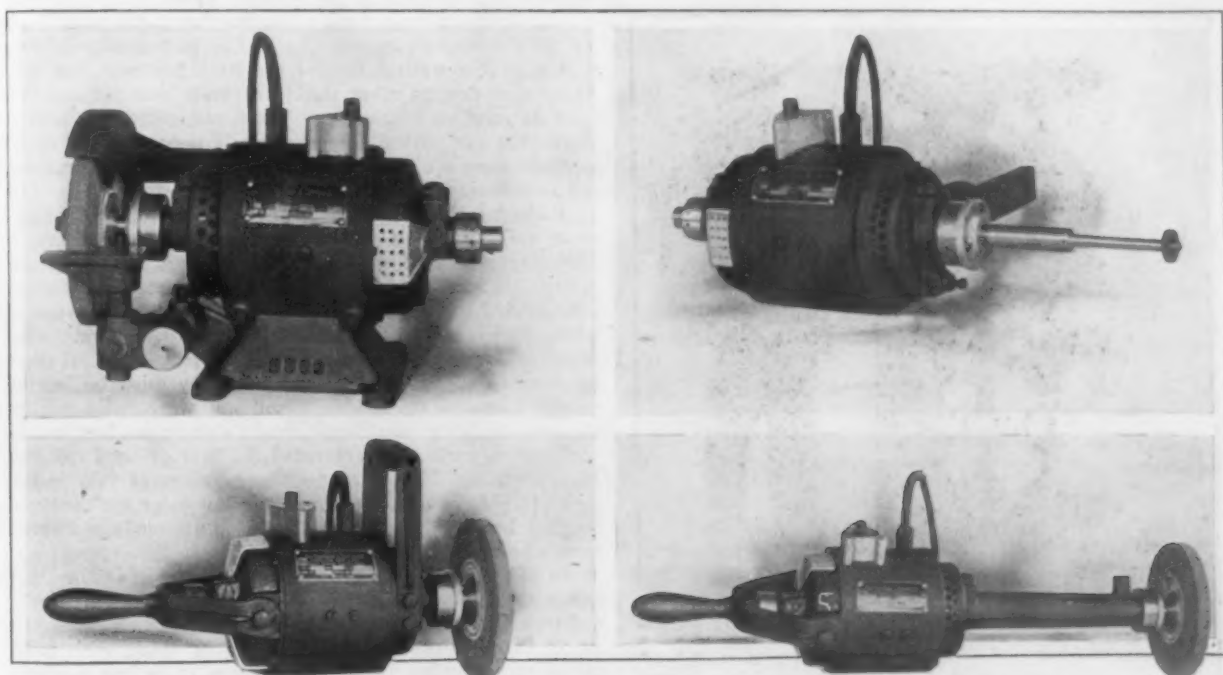


Fig. 1—The Bench Type
Fig. 3—Aerial Machine

Fig. 2—Tool Post Type
Fig. 4—Extended Aerial Type

Four New Styles of Portable Grinding Machines for Use on Either Direct or Alternating Current Circuits

being selected to produce a maximum power with a minimum weight. Swedish iron is used for the pole pieces and the shell of the motor is of special magnetic steel. The windings are protected by a special process of insulation which is claimed to reduce the trouble from short-circuits to a minimum. The commutator is made from drawn copper and mica gauged to micrometer dimensions. It is stated that the mica used will wear down with the copper and thus result in the elimination of sparking. While being built up the segments are held in jigs during the various operations, including the assembling into the commutator shell and head, thus insuring accuracy. Owing to the design of the commutator and the special construction of the shell and head which hold the copper and the insulating segments in place, a solid construction is secured which, it is claimed, effectually prevents distortion of the copper segments by heating or speed.

The brush holders are located on a fibre insulated base fastened to the head and are easy of access for inspection, cleaning or replacement of the brushes. A small removable shutter makes it unnecessary to dismantle the machine or remove the head to get at the brushes. A ventilating fan is provided to keep the motor cool, although it is claimed that with the winding used the temperature rises but slowly.

The wheel end bearings are of phosphor bronze, tapered for adjustment which is accomplished by loosening three screws and turning the bearing housings slightly. There are thrust end bearings which are adjusted by pushing in

ishing work and with a 12-in. extension for general grinding work where the work is to be dressed inside. This type, which is shown in Fig. 4, can also be used for buffing and polishing. Each machine is equipped with a cable and fused plug for connection to any electric light socket. All the machines use wheels 6 in. in diameter and having a face width of $\frac{3}{4}$ in., except the tool post type which can be supplied either with this size or one $1\frac{1}{4}$ in. in diameter with a $\frac{1}{4}$ -in. face.

In making steel by the electric furnace, France occupies the first position as regards tonnage of output, but M. Aimé Coutagne admits, in *Lumière Electrique*, that the total amount of steel thus made is very small, although it is increasing little by little. The future, he says, points to the application of the electric furnace for refining open-hearth steel and that electric smelting is without doubt to be expected to replace the coke blast furnaces only in countries where coal is dear and electricity is available, and where the ore is rich and near the works, as in the case of Scandinavia, and on a smaller scale of California.

Stellite bars for lathe tools can now be obtained up to and including 1 in. square by 6 in. long. The material, which is an alloy of the semi-rare metals, as mentioned a few weeks ago in these columns, is obtainable from Elwood Haynes, Kokomo, Ind.

European Electric Steel Automobile Castings

Characteristics of Remarkable Castings Made in a Switzerland Steel Foundry — The Electric Process Most Suitable for Fine Work

BY E. F. LAKE

In Europe steel castings are used for automobile parts to a much greater extent than in this country. A great deal more care is taken there in the manufacture of these castings and the metal is homogeneous, dense, and free from blow-holes. This enables the walls to be cast very thin, and only one-half as much finish is allowed as in this country. Hence the machining cost is reduced. Castings are also made from any composition of metal that is required.

In some castings the carbon content is so low that the metal is often classed with wrought iron. In others the

the cope side. When machined the metal has a dense, fine grained appearance; no blow-holes or gas bubbles of any kind are seen. If there are any, it is sufficient cause for rejection.

In Fig. 2 is shown a set of automobile castings that have been assembled in the rough; no machine work being done on them. It illustrates the absence of warpage in these castings. Their walls are $\frac{3}{16}$ in. thick. The finish allowed on the drag side is $\frac{1}{8}$ in. and on the cope side $\frac{3}{16}$ in. The outer and inner surfaces presented a smooth, clean surface with absolutely no signs of flaws.

All of the castings made from this "auto cast steel" have as smooth and clean surfaces as the best grades of iron castings. The composition of the steel, however, has little to do with this, as other steels are made into castings that have as good an appearance. When cut into these castings show that the outward appearance is not deceitful, as no imperfections are found, and they are positively guaranteed not to contain any blow-holes.

Reducing the impurities in the molten metal to a minimum and pouring it just at the right temperature are of vital importance, if strong, sound castings are to be obtained. It is also of vital importance to have the correct sands, carefully made molds and cores, and good ovens in which to properly bake them. After that, accurate temperatures must be obtained, for the correct length of time, to properly anneal the castings, and they must be located in the furnaces so that they will not warp. To neglect any one of these operations means a poor product, but if each one is carefully performed the best of steel castings can be made. There are no secret processes that insure high grade castings. If tonnage and low price are the main motives, however, the fine castings that are made in Europe cannot be made in this country.

In Fig. 3 is shown a group of miscellaneous castings for motor cars. They consist of different styles of differential and transmission gear cases, axle housings, chain cases, etc. In all of these the steel was cast $\frac{1}{8}$ in. thick, with practically no mis-runs. The foundry loss from bad castings, on such parts, is less than five per cent. Only $\frac{1}{8}$ in. finish is allowed on any of the surfaces to be machined, whether they come in the drag or in the cope. Even then the metal cleans up better than most castings made in this country, where as much as $\frac{3}{8}$ in. finish is allowed on the cope side. In fact, no imperfections are seen when the $\frac{1}{8}$ in. of rough metal is machined off.

In manufacturing such castings the melting process is

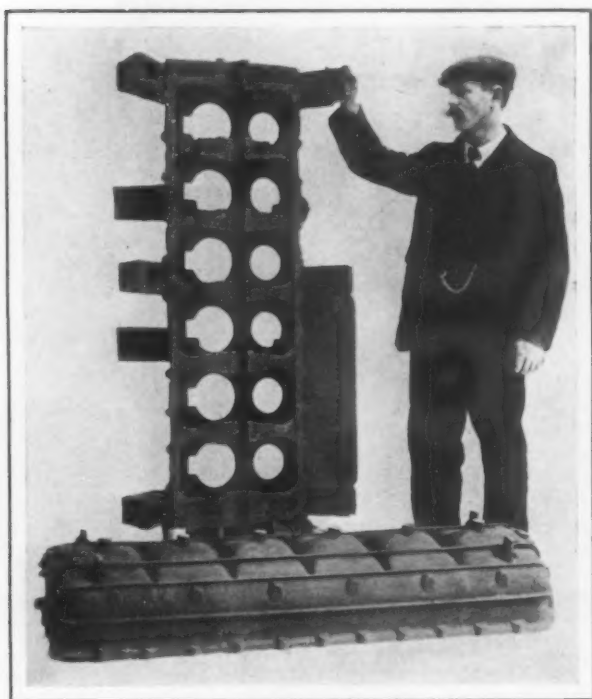


Fig. 1—Upper and Lower Halves of Crank Case for Six Cylinder Automobile Engine

percentage is so high that the metal is comparable with high grade tool steel. Castings are also made with any percentage of carbon that is demanded between these two extremes. In addition to this nickel, chromium, tungsten, molybdenum, titanium, vanadium, copper, cobalt, boron and other elements have been added to enable castings to be made from any kind of an alloy that is desired.

A concern that stands in the front rank of fine steel casting makers is the Geo. Fisher Steel & Iron Works, Ltd., Schaffhausen, Switzerland. The photographs for illustrating this article were furnished by that company. The automobile castings here shown are made from a special composition of metal, which they have named "auto cast steel." Numerous tests of this steel show it to have a tensile strength of over 60,000 lb. per sq. in.; an elastic limit of more than 35,000 lb.; a contraction that exceeds 50 per cent., and an elongation better than 30 per cent. in 4 in. It is in the shock test, however, that it shows the most excellence. With test bars resting on supports $6\frac{1}{2}$ in. apart, a drop that weighed 110 lb. falling 9 ft. 10 in. took from 20 to 27 blows to cause rupture. When it is understood that the official test for locomotive castings in Switzerland only requires 3 blows before rupture, one can realize the quality of these castings.

In Fig. 1 is shown the largest of the automobile castings made. These are the upper and lower halves of the crank case for a 6-cylinder engine. The outer walls are but $\frac{1}{4}$ in. thick, and only $\frac{1}{4}$ in. is allowed for finish, over the entire surface, where the two halves fit together, this being

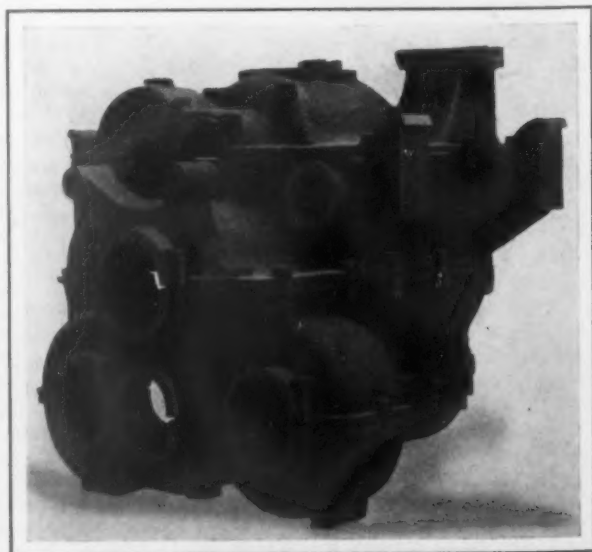


Fig. 2—An Assembled Set of Automobile Castings

the first thing to be considered. As good castings cannot be obtained with the open-hearth process unless the refining is done in a basic furnace and the molten steel then transferred to an acid furnace and there held for the majority of the gases to escape from the bath, before making the additions that give the kind of steel required. Even then the sulphur and phosphorus cannot be readily reduced and this requires the use of high grade material. It is also too expensive unless large castings are made, and hence large amounts of molten metal handled at one time. Segregation is also high in such castings and hard spots often occur. Thus, for various reasons, high grade steel castings cannot be made with the open-hearth process. The Bessemer process need not be mentioned, as it is well known to be less adapted to such work than the open-hearth and only applicable to very cheap castings.

The small converters are much better, because sound, close-grained and strong steels can be turned out with these if the materials are properly handled. Gases from combustion materials do not attack the molten metal, as in the above processes, and oxidation is carried to a higher point. With correct molding methods, blow-holes and other imperfections are not present in the castings to any great extent. This process has its limitations, however, and it is best adapted to medium grades of steel castings. The extra fine grades require the crucible or electric furnace processes for melting and refining.

The crucible process was developed and perfected with the clay crucibles that are used in Europe. When the materials are carefully selected, mixed and placed in these clay crucibles, which are sealed up to exclude all air, the metal cannot absorb the impurities that it does in the processes mentioned above. The oxides and occluded gases are reduced and the sulphur and phosphorus are kept low. Thus the steel is much freer from impurities and stronger. It is not equal to the electric furnace for refining steel and is more expensive. Hence the latter process was adopted for manufacturing the castings herewith illustrated.

The graphite crucibles used in this country are injurious to the metal, and hence poorer castings are produced with them. They have cheapened the process and also destroyed most of the results that made this process better than the converter or open-hearth processes. In America better castings are now made with either of these than with metal that is melted in graphite crucibles. The castings that are the least homogeneous today are those that are made by the graphite crucible process and sold in the open market. This is largely due to segregation. Some of this is caused by the graphite in the crucibles; some by the metal being too cold when it is poured into the molds, and some by having the gate at the top of the casting, rather than at the bottom. The five elements that segregate the

most are sulphur, phosphorus, manganese, carbon and copper.

The electric furnace will produce steels of much greater purity than any of the above processes. Metals that are hotter when ready to pour can also be taken from this furnace. When this process has once been established, the highest grade of steel castings will doubtless come from the electrically melted and refined steels. The electric current causes such a tremendous agitation of the bath that the impurities are given comparatively free passage to the slag. The sulphur and phosphorus are reduced to mere traces. The atmosphere in the furnace is strictly non-oxidizing, and thus the molten metal does not absorb oxygen, nitrogen and other injurious gases. Rather the oxides, nitrides, etc., are reduced to a minimum and the metal is made denser and stronger.

By this process the liability of blow-holes forming in the

castings is reduced to a minimum. In the ordinary furnace, too sharp a flame, too much air admitted for flame and combustion, or a too liberal use of ore are causes of blow-holes. All of these are overcome by using the electric furnace. They might be overcome in some of the other processes of melting by an increase of deoxidizers and the use of two or more slags. But this is liable to sacrifice toughness in the castings. When the blow-holes are oblong, with their longest dimension at right angles to the cooling surface, they are due to an imperfect deoxidization or killing of the molten metal. They occur just under the skin on all sides of casting.

Blow-holes may also be caused by air, vapor or gas attacking the mol-

ten metal when it is being poured. Damp sands, too tight ramming, imperfect venting, top pouring and incorrect risers, all cause these gas or air bubbles to be entrapped when the metal freezes. Such blow-holes are nearly always globular in shape and found only in the cope side of the casting. The correct molding methods will therefore overcome this class of blow-holes. When the electric furnace is used in conjunction with careful molding methods, blow-holes, porosity and other imperfections can be entirely obliterated, as is the case with these castings.

Some of the most interesting of these castings are shown in Fig. 4. These wheels have cored spokes and rims, and the larger sizes shown are the latest type of wheels for motor car trucks. Some of the largest manufacturers in England are using these wheels, and the Italian, French and German governments have specified them for their military motor trucks. A prominent American automobile maker is understood to be using them on 100 trucks and other American manufacturers are putting them to severe tests. For trucks with a capacity below three tons, the solid rim and hollow spoked wheels are usually used,



Fig. 3—An Assortment of Thin Steel Castings for Automobiles

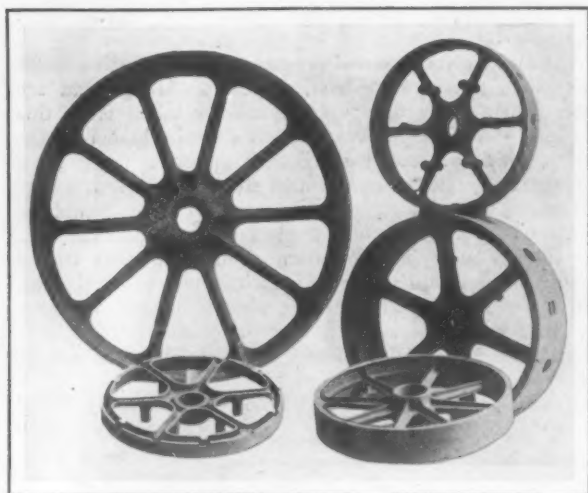


Fig. 4—Wheels with Hollow Spokes and Rims

while for trucks above three tons both the rims and spokes are cored out. In the smaller of these wheels the metal is but $\frac{1}{8}$ in. thick and in the larger ones it is $\frac{3}{16}$ in.

In Fig. 5 are shown various styles of solid and fan blade fly wheels. Only $\frac{1}{8}$ in. of metal is allowed for machining wherever this is required, while the blades or spokes are but $\frac{1}{8}$ in. thick. The small fillets that can be used without the castings cracking are also features of these castings.

Annealing is a necessity for all high grade steel castings. To merely allow castings to cool off in the mold or on the floor, after being shaken out of the sand, is poor practice. The internal strains are not equalized; the metal will be more or less brittle; there are liable to be hard spots, and the grain will be coarse. By heating the castings to slightly above the transformation point and then cooling them slowly, a new grain structure is formed that is finer and less crystalline. While this is forming the internal strains equalize themselves; the hard spots disappear; the metal becomes more homogeneous, and hence its strength and wearing properties are greater. If the cooling down time is prolonged enough, very soft, ductile castings are obtained. If a greater hardness is required, they can afterward be heat-treated.

While the chemical composition of the steel alters the

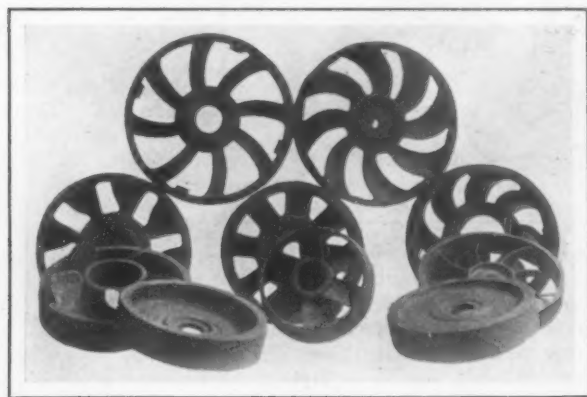


Fig. 5—Solid and Fan Blade Fly Wheels

correct annealing temperature, the ordinary carbon steel castings should be heated to 850 deg. C. and held there for several hours, according to size. After that 12 hours should be taken in which to cool them down from this temperature to below 200 deg. C. They can then be cooled to atmospheric temperature as rapidly as desired. To heat them below this temperature does not allow the new grain structure to be born, and every degree that they are heated above that adds to the coarseness of the grain. If heated to 950 or 1000 deg. C. the grain will be as coarse as that of the castings that are not annealed.

The proper heat treatment of steel castings is of vital importance; this fact is being recognized more and more. A first-class casting can be rendered a poor one by the annealing.

January Iron and Steel Exports and Imports

The January report of the Bureau of Foreign and Domestic Commerce shows an increase in both our iron and steel exports and imports, as compared with the figures for December. The total value of the exports in January of iron and steel and manufactures thereof, not including ore, was \$25,141,409, against \$23,750,864 in December. The value of similar imports in January was \$2,860,510, against \$2,649,485 in December.

The January exports of commodities for which quantities are given total 249,523 gross tons, against 235,953 tons in December. Details of the exports of such commodities for January and for seven months of the current fiscal year ended with January are as follows, compared with corresponding periods of the previous fiscal year:

Exports of Iron and Steel

Commodities	January		Seven Months	
	1913 Gross tons	1912 Gross tons	1913 Gross tons	1912 Gross tons
Pig iron	26,128	8,663	166,487	62,331
Scrap	11,228	7,881	60,974	40,280
Bar iron	2,009	861	16,445	9,017
Wire rods	8,985	3,271	40,229	17,427
Steel bars	18,171	10,319	140,476	70,452
Billets, ingots and blooms, n.e.s.	18,056	12,779	177,919	111,205
*Bolts and nuts	1,783	.....	11,769	.....
†Hoops and bands	2,039	579	10,089	4,309
*Horseshoes	109	.....	620	.....
Cut nails	355	593	3,419	6,698
†Railroad spikes	1,053	.....	7,722	.....
Wire nails	4,009	1,976	35,009	27,574
All other nails, including tacks	363	653	2,394	7,059
Pipes and pipe fittings	24,433	15,968	141,121	114,470
Radiators and cast-iron house heating boilers	735	223	4,918	2,707
Steel rails	35,695	24,445	256,615	216,459
‡Galvanized iron sheets and plates	9,702	.....	79,661	.....
‡All other iron sheets and plates	3,248	12,931	20,454	92,327
‡Steel plates	19,643	17,123	155,244	145,323
‡Steel sheets	9,283	.....	75,763	.....
Structural iron and steel	30,654	13,647	186,398	132,762
Tin andterne plates	4,793	4,076	41,085	39,879
Barbed wire	5,455	6,698	54,887	63,171
All other wire	11,593	8,888	85,299	74,918
Totals	249,523	151,574	1,774,997	1,238,348

*Included in "all other manufactures of iron and steel" prior to July 1, 1912.

†Included in "all other manufactures of iron and steel" from July 1, 1910, to June 30, 1911.

‡Not separately stated prior to July 1, 1912.

The January imports of commodities for which quantities are given total 21,739 gross tons, against 21,230 tons in December. Details of the imports of such commodities for January and for seven months of the current fiscal year ended with January, compared with the corresponding periods of the previous fiscal year, are as follows:

Imports of Iron and Steel

Commodities	January		Seven Months	
	1913 Gross tons	1912 Gross tons	1913 Gross tons	1912 Gross tons
Pig iron	11,633	13,085	95,082	72,530
Scrap	3,384	623	18,877	6,742
Bar iron	1,528	2,055	16,500	14,588
*Structural iron and steel	1,430	352	3,284	1,948
Billets, bars and steel plates, n.e.s.	1,882	1,392	11,304	14,597
*Steel rails	166	208	2,255	1,814
Sheets and plates	224	265	2,213	1,475
Tin andterne plates	249	266	1,314	2,232
Wire rods	1,243	1,759	9,050	8,425
Totals	21,739	20,005	159,879	124,351

*Included in "all other manufactures of iron and steel," prior to July 1, 1911.

The January imports of iron ore were 175,463 gross tons, against 199,982 tons in December and 154,188 tons in January, 1912. The total quantity of iron ore imported in the seven months of the current fiscal year ended with January was 1,285,663 gross tons, against 1,163,982 tons in the corresponding period of the previous fiscal year.

The total value of the exports of iron and steel and manufactures thereof, excluding ore, in seven months of the current fiscal year ended with January was \$174,224,356, against \$137,442,207 in the corresponding period of the previous fiscal year. The total value of similar imports was, respectively, \$18,705,427 and \$15,471,677.

The annual meeting of the Kentucky Manufacturers' Association, of which iron working establishments are leading members, will be held in Louisville April 17-19. John F. Bible, Hopkinsville, Ky., is president of the organization.

The Joint Supply Conventions

Programme of the three meetings to Be
Held at Indianapolis April 10, 11 and 12

The arrangements for the joint conventions of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association to be held at Indianapolis, Ind., April 10, 11 and 12, have been completed. The three days will be well crowded with discussions of trade topics and association matters interspersed with plenty of relaxation from the more serious purposes of the gathering. While the three associations are to consider their own questions and conduct their business separately, there will be, as usual, a joint meeting of the three bodies. A large attendance is assured from the many hotel reservations already made. The convention headquarters will be in the Claypool Hotel.

The morning of the opening day, Thursday, April 10, will be devoted to a joint session for which the following is the programme:

Open Session, April 10, Morning—N. A. Gladding, Indianapolis, Ind., president American Supply and Machinery Manufacturers' Association presiding. Prayer—Rev. Frederick E. Taylor, pastor First Baptist Church, Indianapolis. Welcome to the state—Governor Samuel M. Ralston. Welcome to the city—Mayor Lew Shank. Welcome on behalf of commercial organizations—C. C. Hanch, president Indianapolis Chamber of Commerce. Response on behalf of the Southern Supply and Machinery Dealers' Association—S. M. Price, Norfolk, Va. Response in behalf of the National Supply and Machinery Dealers' Association—W. L. Rodgers, Pittsburgh, Pa. Response in behalf of American Supply and Machinery Manufacturers' Association—D. K. Swartwout, Cleveland, Ohio. Introduction of prominent guests. "Re-Sale Prices and Price Maintenance," by W. Marshall Bullitt, solicitor-general of the United States.

At the close of the exercises the convention will go into joint executive session for the discussion of matters of common interest.

The programme of the Southern Supply and Machinery Dealers' Association is as follows:

Executive Session, 2 p. m., April 10. Report of President S. M. Price. Report of Secretary-Treasurer Alvin M. Smith. Reports of committees, presentation of resolutions, appointment of committees and instructions.

Friday, April 11, 9.30 a. m., Executive Session. Address—"Our Traveling Salesmen—Method of Handling Their Expense Accounts and Daily Reports," J. C. Miller, Miller Supply Company, Huntington, W. Va. Address by Charles R. Crane, Crane Company, Chicago. Discussion—"Banking and Currency Reform." Opened by E. Howard Smith, Superior Supply Company, Bluefield, W. Va. Discussion—"Responsibility for Loss or Damage to Goods Shipped by Parcel Post." Question Box.

Executive Session, 2 p. m., Discussion—"Sight Draft B. L. and C. O. D. Shipments Associated with Delays by Bank in Collecting Sight Drafts." Address—"Associations—What of Their Value? What of Their Future?" George D. McIlvaine, secretary National Pipe and Supplies Association, Pittsburgh.

Saturday, April 12, 9.30 a. m. Unfinished business, new business, report of committees, election of officers.

The National Supply and Machinery Dealers' Association will follow this schedule:

Thursday, April 10, 2 o'clock p. m., Executive Session. Address of President W. L. Rodgers. Report of Secretary-Treasurer Thomas A. Fernley. Report of Executive Committee. Discussion—"Co-Operation and Its Service in Securing Better Prices, More Business, Better Profits, Satisfied Customers and Success." Appointment of Nominating Committee. Question Box.

Friday, April 11, 9 o'clock a. m., Executive Session. Discussion—"Manufacturers' Competition—How Can We Meet the Situation Created by the Extension of Manufacturers' Lowest Prices to Retailers and Consumers?"

"Should We not as Mill Supply Dealers, Carrying Large and Well Assorted Stocks, Be Able to Sell Such Trade at as Low a Price as the Manufacturer Does?"

Discussion—"Short Margin Lines—How Can They Be Eliminated?" Discussion—"Compensation of Salesmen." Opened by F. W. Swanson, Globe Machinery & Supply Company, Des Moines, Iowa. Discussion—"Cost of Doing Business." Report on ballot.

Executive Session, 2 o'clock p. m. Report of the Membership Committee. Discussion—"How Can Our Margin of Net Profit Be Increased?" Discussion—"Are Manufacturers' Established Selling Prices Being Respected?" Discussion—"Present Status of Re-Sale Price Question." Discussion—"Supply Houses Operated by Consuming Corporations." Discussion—"Can Mill Supply Dealers Continually Cut Prices and Remain Solvent?"

Saturday, April 12, 9 o'clock a. m., Executive Session. Discussion—"Syndicate-Buying Situation."

New business, report of Nominating Committee, election and installation of officers, expression of preference regarding place of next convention.

The proceedings of the American Supply and Machinery Manufacturers' Association will be conducted as follows:

Thursday, April 10, 2 o'clock p. m., Executive Session. Address of President N. A. Gladding. Report of Auditing Committee. Report of Secretary-Treasurer F. D. Mitchell. Report of Executive Committee, John K. Broderick, chairman. Report of Membership Committee, Neil W. Snow, chairman. Report of Entertainment Committee, Geo. T. Bailey. Report of Credentials Committee, A. F. Corbin. Report of Labor Legislation Committee, John K. Broderick, chairman. Announcement of Resolutions Committee. Announcement of Nominating Committee. "Sales Department Management," Walter H. Cottingham, president Sherwin-Williams Company, Cleveland, Ohio.

Friday, April 11, 9 o'clock a. m., Executive Session. Address—"Putting the 'Biz' in Business," Tim Thrift, advertising manager of The American Multigraph Sales Company, Cleveland, Ohio. Address—"Uniformity in Cost Accounting," Charles A. Brown, Lunkenheimer Company, Cincinnati, Ohio.

Executive Session, 2 o'clock p. m. Address—"Selling Costs." Address—"Conservation of the American Business Man," Willard Parker, Pennsylvania Shafting Company, Spring City, Pa.

Saturday, April 12, 9 o'clock a. m., Executive Session. Address—"Distribution and Sale of Manufactured Products," Adrian D. Joyce, general sales manager, Sherwin-Williams Company, Cleveland, Ohio. Address—"Business Correspondence," J. A. Beynon, Dodge Mfg. Company, Mishawaka, Ind. Action on resolutions presented, report of Nominating Committee, election of officers.

The social events and entertainments of the convention include a "Get Together" meeting in the auditorium of the Claypool Hotel, at which music, vaudeville and refreshments will assist, on the evening of April 10; a theater party on the evening of April 11, followed by a supper at the Deutscher Club, and on the afternoon of April 11 specially arranged motor races on the Indianapolis motor speedway. On the afternoons of April 10 and 11 there are to be special entertainments for the ladies who accompany the members.

Influence of Degree of Fusion on Sintered Material

At the recent meeting of the American Institute of Mining Engineers, B. G. Klugh, Birdsboro, Pa., presented a paper on "The Microstructure of Sintered Iron-Bearing Materials." Some 13 microscopic views of sinter of iron-bearing material were shown to indicate the value of sintering by the Dwight & Lloyd process. Emphasis was placed on the desirability of having sufficient heat to bind together the particles to be treated, with almost complete removal of sulphur, and yet not sufficient to combine the silica and the iron. One of the photomicrographs shown was of sinter from Cornwall ore, sintered with 3 per cent. of fuel. Another was of sinter from Norwegian magnetic concentrates. A sinter by the Dwight & Lloyd process was also studied from flue dust and pyrites-cinder, from granular hematite ore, from flue dust and magnetite and from flue dust containing about 8 per cent. carbon. The conclusions arrived at from the observations were as follows:

1.—The permeability of the cell-wall of a sintered product varies, inversely, as the degree of fusion to which it has been subjected.

2.—In a product of complete fusion, the silica present combines with its equivalent of iron oxide to form a perfect glass which, from its greater fluidity, envelops and seals up the remaining iron oxide from the action of gases.

3.—Conversely of the foregoing conclusion, in the product of the lowest degree of fusion, the iron oxide and slag-forming materials as a unit are bonded together by incipient fusion, leaving the predominant iron oxide, free and vulnerable to the action of the gases, in the highest degree attainable in solid products.

4.—The above salient facts show that the Dwight & Lloyd product when properly made, possesses those properties which distinguish it from the products of other sintering processes or agglomerating methods, by freedom from those constituents to which scouring action in the blast-furnace is attributed.

Studies of the Cupola Melting Process

Tests of Iron and Slag at Intervals Throughout the Operation—Material and Heat Balance Sheets

The cupola melting process is the subject of a paper in *Stahl und Eisen* for January 30, 1913, by Dr. F. Hüser of Griesheim-am-Main. The tests were carried out on the

gave an average for three days of 19,686 cu. ft. per second. More blast is received at the beginning, because as the melting goes on the tuyeres decrease in area and the column of charge becomes dense. There is more opposition therefore to the blast, and the fan does not furnish so

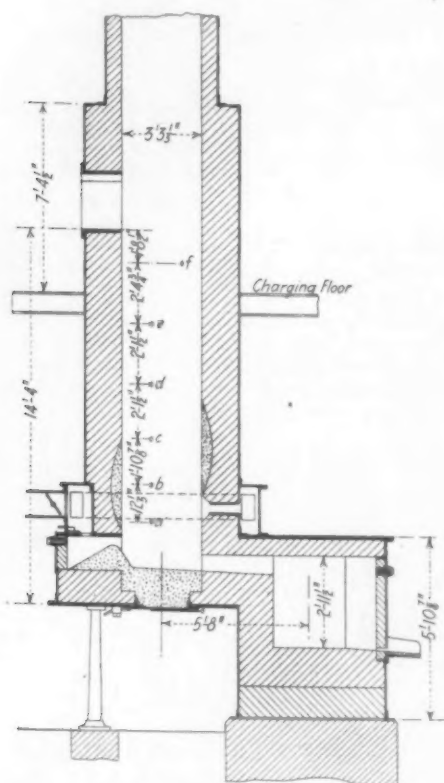


Fig. 1—Section Through the Cupola

cupola shown in Figure 1, which has two tuyeres, one in front 70 x 190 mm. (2.75 x 7.48 in.) and one behind 130 x 500 mm. (5.12 x 19.68 in.), their total cross section being

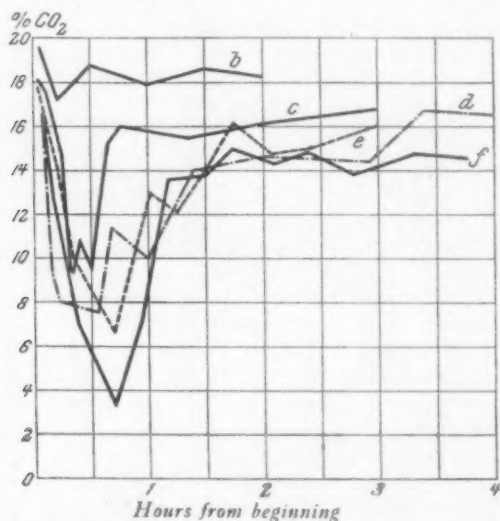


Fig. 2—Carbon Dioxide in Volume Percent of the Gases from the Different Holes

1-10 that of the furnace. The blast is taken from a common blast main serving four furnaces; it is furnished by a fan and is regulated by a throttle valve. The pressure on starting was 7.96 oz. per sq. in.; as the tuyeres slagged up it increased so that in about an hour it was about 13.64 oz., and during the remainder of the test it varied between 13.64 and 15.91 oz. Measurements of the volume of blast

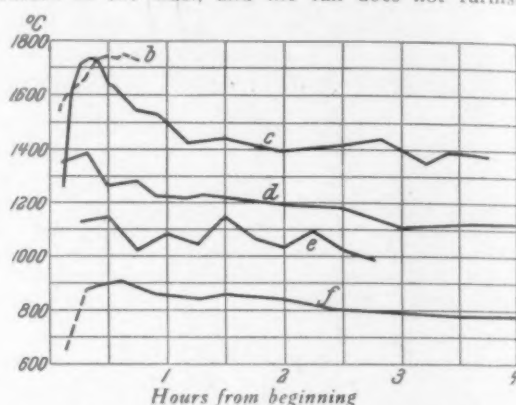


Fig. 3—Furnace Temperatures at the Different Holes

much; in other words, its efficiency drops with increased opposition.

The loss of blast through leakage in the joints, etc., and oxidation of iron, manganese, silicon, phosphorus and sulphur was found to be an average of 16 per cent. At the beginning it was lower but increased at the end to 20 per cent.

Gas and Temperature Conditions

In order to determine these conditions in the different parts of the furnace holes were bored through the shell and lining in the six places shown in Fig. 1. Detailed tables are then given of the analysis of the gases taken from the different holes, and a description of the arrangement used for taking the samples. No correct samples could be obtained from hole *a* because it continually kept closing up. The CO_2 percentages are shown graphically in Fig. 2. Samples of the waste gases were taken by means of a pipe, penetrating about 16 in. into the charge.

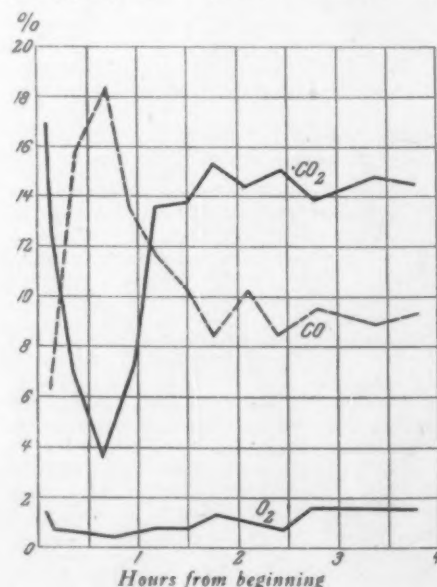


Fig. 4—Analysis of Waste Gases

The average sulphur of four tests taken on different days was 0.978 g. per cu. m. (0.43 g. per cu. ft.). The temperatures were measured by a Le Chatelier couple as far as

possible, but for the two lower zones a Wanner optical pyrometer was used, mounted in a special air-tight arrangement which is described. Hole *b* could not be kept free from slag very long, and at hole *a* the measurements were still more difficult to make, and are not included in Fig. 3, which shows the temperature graphically. From Fig. 3 it is seen that in the first part of the campaign zone *d* is still within the melting zone, which is due to the height of the coke bed. Zone *c* is continually within this melting zone, which is also shown by the strongly slagged walls of this part of the furnace. The gradual decrease of the temperature here leads to the conclusion that the coke bed slowly decreases in volume.

The melting zone covers the large extent of about one meter above the upper corners of the tuyeres. The blast does not go straight through to the center of the furnace from the tuyeres, but presses upward and only gradually makes its way inward. The best arrangement of the tuyeres would appear to be one where they occupy a small height, and where each tuyere is inclined downwards, so that the blast penetrates in a curve and reaches the center at about the height of the tuyeres. This ideal condition will be strongly influenced by slagging, but experience has shown that combustion will be very complete and the melting zone limited to its smallest amount. About half of the bed coke is placed in position three hours before starting and is brought to a clear red heat; the remainder is added half an hour before starting and is therefore well pre-heated. When the blast is admitted the whole amount is soon raised to incandescence. This explains the results shown in Fig. 4, giving the analysis of the waste gases. The complete combustion (formation of CO_2) shown at the beginning changes very quickly, so that in barely 3-4 hr. the relations of CO_2 and CO are directly reversed.

is reached, the amounts of about 44.5 per cent. CO_2 and 9.3 per cent. CO not changing much thereafter. From Fig. 2 it is seen that combustion in the tuyere zone is tol-

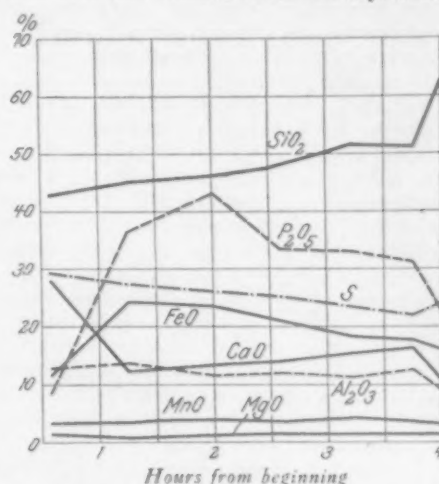


Fig. 6—Composition of Slag at Different Stages of the Heat

erably complete (zone *b*), the CO_2 produced here being reduced in the upper zones.

Liquid Products of the Furnace

Details are given of the kind of material and amount used for patching the furnace before starting, the bed coke, the limestone, and the metal charge, analyses being given in all cases. The average analysis of the charge

TABLE 2.—SLAG ANALYSIS

No.	Time From Beginning, Hr. Min.	Blast Oz. per Sq. In.	Position.	Appearance.	SiO_2 %	FeO %	Al_2O_3 %	CaO %	MgO %	MnO %	P_2O_5 %	S %
1	1 35	10.92	Channel	Greenish black.....	43.32	11.09	12.30	28.52	1.42	3.32	0.087	0.297
2	1 15	13.43	Channel	Brownish black.....	45.37	24.50	13.25	12.36	0.66	3.37	0.362	0.271
3	2 00	14.68	Channel	Brownish black.....	47.00	23.72	11.47	13.61	0.73	3.73	0.433	0.258
4	2 35	15.91	Channel	Brownish black.....	48.21	21.35	11.68	14.76	0.78	3.52	0.346	0.248
4a	2 45	16.38	Spout	Brown-greenish black.....	47.51	20.39	12.04	15.41	0.71	3.32	0.374	0.249
5	3 15	17.75	Channel	Brownish black.....	51.18	18.35	11.05	15.23	0.71	3.59	0.333	0.234
6	3 45	18.66	Channel	Brownish black.....	50.66	17.59	12.76	16.10	0.80	3.16	0.311	0.217
7	4 00	0	Channel	Brown-greenish black.....	62.35	15.45	8.11	10.61	0.70	2.91	0.229	0.241
Average channel.....					47.62	19.43	12.09	16.76	0.85	3.45	0.312	0.254

In 42 min. the CO_2 drops to a minimum of 3.4 per cent. while the CO climbs to a maximum of 18.3 per cent. At this time the conditions are those of gas producer practice, with a strongly reducing influence. The further the

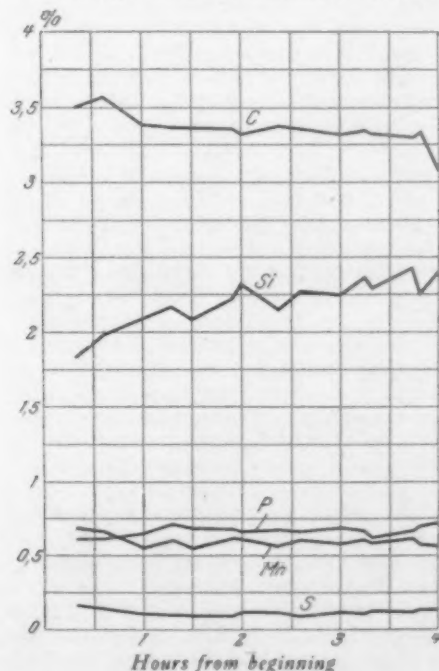


Fig. 5—Composition of Iron at Different Stages of the Heat

coke bed burns down the smaller is the reducing influence of the layers of coke. The gas, therefore, becomes richer in CO, and after about two hours a state of equilibrium

was: C, 3.30 per cent.; Si, 2.52 per cent.; Mn, 0.72 per cent.; P, 0.68 per cent.; S, 0.059 per cent. The coke had 1.11 per cent. sulphur. Besides metal the furnace gives in this experimental run 1330 kg. of slag = 5.22 per cent. of the weight of iron; and at the end when the bottom was dropped 120 kg. of coke was left. During the whole run, which lasted four hours, tests of the metal were taken every 15 to 20 min. and of the slag every 40 min. with a long handled wrought-iron spoon lined with loam and graphite. The results are given in Tables 1 and 2. "Channel" means the channel between the furnace and the fore-hearth, while "spout" means the tapping spout.

TABLE 1.—IRON TESTS

No.	Time From Beginning, Hr. Min.	Blast, Oz. per Sq. In.	Position.	C.	Si.	Mn.	P.	S.
1	1 20	8.88	Channel.....	3.50	1.82	.68	.626	.164
2	1 35	10.92	Channel.....	3.55	1.97	.67	.626	.146
3	1 00	13.43	Spout beg....	3.38	2.01	.56	.630	.116
4	1 00	13.43	Spout end....	3.36	1.99	.51	.665	.114
5	1 15	13.43	Channel.....	3.36	2.18	.61	.708	.112
6	1 30	13.43	Spout beg....	3.31	1.98	.54	.690	.104
7	1 30	13.43	Spout mid....	3.39	2.07	.53	.656	.094
8	1 30	13.43	Spout end....	3.36	2.13	.57	.686	.104
9	1 55	14.56	Spout.....	3.36	2.22	.61	.673	.104
10	2 00	14.68	Channel.....	3.33	2.31	.61	.646	.116
11	2 25	16.38	Spout.....	3.38	2.16	.58	.690	.112
12	2 35	15.91	Channel.....	3.36	2.27	.62	.693	.088
13	3 00	17.41	Spout.....	3.32	2.25	.58	.698	.112
14	3 15	17.75	Channel.....	3.33	2.39	.61	.682	.102
15	3 20	17.98	Spout.....	3.31	2.29	.59	.617	.116
16	3 45	18.66	Channel.....	3.29	2.44	.63	.682	.116
17	3 50	18.66	Spout.....	3.31	2.25	.59	.700	.118
18	4 00		*Channel.....	3.08	2.40	.58	.715	.124
Average ...				3.35	2.17	0.59	0.672	0.115

*Last few drops.

The results are also shown graphically in Figs. 5 and 6. Silicon, sulphur, and carbon show the greatest changes. From the C line of Fig. 5 it is seen that at the beginning the carbon rises a little, which is due to the drops of metal having to pass through the large amount of fuel in the coke bed. After about the first hour it remains uniform

until the extreme end, when the atmosphere in the furnace is strongly oxidizing. The silicon shows a continuous slow increase, and Fig. 6 shows the connection between this fact and the slag analysis. In the first hour the silicon loss is the greatest, being slagged off by the lime in the coke bed. It amounts to 37 per cent., but the average loss is only 14 per cent. Towards the end the slag is higher in silica because of the slagging of the lining which protects the silicon, so that only 7 per cent. is lost. The lime in the coke bed appears to work directly the opposite in the case of manganese. In the first $\frac{3}{4}$ hour the loss is only 3.5 per cent., but with decreasing lime and increased CO_2 in the gases this increases so that during the further course of the charge the loss averages 22 per cent. The average increase in sulphur is 95 per cent., but at the beginning it is as high as 160 per cent., due to the bed coke.

Finally, the material and heat balance sheets are carefully worked out. The results of the first per 100 kg. iron, in per cent. by weight of the iron charged, are:

Charged.		Obtained.	
Iron	100.00 kg.	Iron	98.95 kg.
Coke	8.88 kg.	Slag	5.22 kg.
Limestone	2.10 kg.	Gases	83.81 kg.
Blast and moisture ..	77.08 kg.	Steam	0.31 kg.
Patching material ..	0.71 kg.	Dust	0.53 kg.

The results of the latter are:

Heat Supplied.		Heat Obtained.	
	Per Cent.		Per Cent.
Combustion of coke	89.56	In the iron	59.95
Combustion or loss of iron constituents	8.95	In the slag	5.55
Heat carried in by charge	0.60	In the gases	30.11
Heat carried in by blast ..	0.89	In the steam	0.59
	100.00	In dust	0.13
			96.33

The difference of 440,220 calories, or 3.67 per cent., represents heat given to the furnace walls and lost by radiation. From these results the heat contained in the iron proves to be 60.8 per cent. of that supplied by the combustion of the coke and the constituents of the metal.

G. B. W.

Equipment Needs of Lumber Manufacturers

The Great Extent to Which Machinery Enters into the Modern Manufacture of Lumber and Other Forest Products

[Washington advices state that lumber is to be placed on the free list in the approaching revision of the tariff. It is further stated that the suggestion of no duty on lumber, which was once anathema to Southern Congressmen representing lumbering constituencies, does not now alarm them. The explanation is given that many items that enter into the cost of producing finished lumber will also be put on the free list or be admitted at much lower rates of duty than are now imposed. "Thus to compensate the unprotected lumberman certain forms of machinery used in manufacturing lumber will be admitted free, while heavy reductions will be made in the duty on other kinds of lumber machinery. This compromise is expected to produce substantial harmony." The subjoined article, which was not prepared with this matter in view, is timely, as showing how intimately machinery and equipment interests are associated with the lumber industry.]

One of the most interesting industrial stories is that which has to do with the development of the forest products business from the time when the first crude sawmill was set up, consisting of a short upright saw slowly making its way through a log by power from a water wheel, to present day methods of lumber manufacture. These methods call for an elaborate system of band or circular saws, edgers, conveyors, burners and kilns, all calling for the product of the machine shop or the equipment manufacturer. Not only in the sawmill has an expansion of this kind taken place, but during the past few years scientific study of the possibilities of the business along various lines has resulted in additional processes being evolved, and consequently has demanded a considerable addition to the equipment of the average mill.

A Constantly Growing List of Machinery

The condition is of special interest to the machinery trade, because there are few industries which have not more or less crystallized, with their processes, and consequently their equipment needs are rather definitely fixed. In industries of this type, the manufacturer of special as well as general machinery need devote his attention only to refinements and changes in existing kinds of equipment; whereas in the production of lumber and kindred commodities from the tree, a constantly growing list of machinery must be provided.

In the sawmill itself, as indicated, the band or circular saw which actually does the cutting is now preceded by steam-driven log skidders and loaders which enable the work of moving the timber from the woods to the mill to be handled with great rapidity and at much less expense than before. And while the old-fashioned mill moved most of its logs with drags or by hand, practically every lumber manufacturer of consequence now has for this purpose a modern derrick, sometimes mounted on a car, so as to give the greatest possible flexibility to its movements. The latter type is used for sorting the logs, an operation the advantages of which have become realized only recently.

In addition to the sawmill proper, many large mills are now equipped with re-saws. Such a machine can handle a large quantity of lumber because of the continuous feed principle upon which it may be operated; while

the bandmill or circular saw requires the log to be carried back after each cut. The carriage and its accoutrements, of course, are now all steam-driven, this equipment being typical and not especially noteworthy.

Conveyors to Handle Waste

The conveyor is probably the best indication of the development of the sawmill. Formerly considered as desirable but not absolutely necessary, lumbermen now have conveyors not only for the purpose of carrying the stock from the saw down the "chute" to the yard for grading and measuring, but to enable the refuse of the mill to be carried to the burner, where it may be disposed of quickly and economically. Burning material which has some intrinsic value seems to be a commercial crime to the casual observer; but practical conditions at the big mills far removed from points where the material can be consumed make it impossible to utilize more than a part of it, which is burned under the boilers, the remainder being disposed of as indicated.

But the lumberman has not abandoned the problem of utilizing waste, by any means. Only recently a company has been formed for the purpose of making use of this material, and plants are to be installed at a number of mills in the yellow pine district for the distillation of the wood and the recovery of such products as charcoal, tar, turpentine, pine tar, pine oil, creosote oil, resin, pyroligneous acid, etc. These plants require boilers, retorts and vats of various kinds, while pumps and conveying systems will doubtless be part of the equipment.

Some of the yellow pine mills have made use of their by-product of waste by installing paper mills. One such mill is now flourishing at Orange, Tex., and another is being built in Mississippi. They can make a wrapping paper of a fair grade from material that has been an absolute economic loss heretofore. Of course the mills have to have power as well as special machinery involved in the manufacture of paper.

Creosoting Railroad Ties

The treatment of railroad ties with creosote so as to render them impervious to the attacks of the elements opened a vast new field for the machinery interests. Only

eight or ten years ago wood preservation was relatively a new idea; to-day it is an established branch of industry. Not only are ties treated, but bridge timbers and all other material that must be exposed to the weather are impregnated, the result being that instead of wearing out in from three to ten years, depending on the character of wood used, the creosoted tie will give service for 20 to 25 years, at conservative estimates.

To give an idea of the expansion of this industry, reference may be made to the development of one particular company, which started in 1907 with one plant and is now building its fourteenth. It recently issued from its office a list of machinery to be purchased for the new plant, which showed that not only would boilers, tanks and structural iron be needed, but also pumps, motors and other elaborate and expensive machinery. There are probably 75 such plants in the United States at present, and the field is said to be just developing.

Parenthetically, it may be noted that this development has not been altogether in favor of the iron business; for, while the creosoting system has extended the life of the wooden tie, it has also reduced the demand for a substitute for the wooden tie.

Boiler Makers Interested

A recent announcement which came as news of importance to the manufacturers of boilers and sheet metal workers generally was that seasoning lumber by the use of steam under pressure was an accomplished success. Here is another problem that sawmill men and wood users generally have been struggling with for years. The dry-kiln, which must be supplied from a steam plant, has been in use for a long time, and has given satisfaction, but a kiln cannot take absolutely green lumber and season it so that it may be put into use. At least, it has been considered more satisfactory to season it in the air for three or four months and then use the kiln. While this is a big improvement over the old way, which required air-seasoning altogether, it is still expensive and extravagant of capital, which might be used to much better advantage in the turnover of goods, instead of remaining idle on the yard of the lumberman or the furniture manufacturer, for example.

Experiments with steam under pressure were made for several years, and only recently have they been successful to a marked extent. It has been found that the steam drives out the sap and moisture remaining in the wood, while the possibility of the board "case-hardening" or "checking," which happens when too much heat is applied in the dry-kiln, seems to have been eliminated. The use of the system calls for much greater boiler capacity than the average mill has, as well as tanks or retorts within which the lumber is placed while being treated. The system costs about \$15,000 to install, and already half a dozen large mills in the South have put it into use.

An Instance of How New Requirements Develop

The constantly shifting requirements of the business were illustrated last year by the floods of the Mississippi River, which overflowed a large section of the valley and inundated hundreds of lumber yards. When the rich alluvial mud of the flood waters was seen, following the subsidence of the waters, to decorate the costly oak and other woods which had been manufactured by the millmen, a unanimous and heartfelt groan went up from the lumber clans. That lumber appeared to be almost a total loss, for no user would care to run the risk of sending such stock through his machinery at the risk of ruining it. To clean it by hand seemed to be the only way, and such a method was obviously tremendously expensive. Then some genius in the business (such geniuses seem to rise at the proper time, invariably) had a brilliant idea. He suggested that brushes take the place of the knives in a planer, which is used for dressing rough lumber. He pointed out that these brushes would scrape the top and bottom of each board, just as the knives do when the planer operates under normal conditions. A machine shop in Memphis, Tenn., turned out the first device, and it worked excellently. The boards were wet before being run through, and the brushes completed the job.

This year floods along the Ohio, Cumberland and other rivers where lumber mills are numerous were recorded, and following them there was a brisk demand for the planer-brushes, which had been stocked up by the

machine shop for just such a contingency. It has not yet become a staple, but it is a pretty good specialty, at that.

The tanners who can get it believe that, just as there's nothing like leather, so there's nothing like the bark of the chestnut oak to make it. Most of them buy the bark from small dealers who gather it in the woods where the tie manufacturers are cutting up the timber. This is not altogether a desirable plan, since the bark deteriorates while accumulating in sufficient quantities to make up carload shipments. Consequently at least one concern in eastern Tennessee is now concentrating the bark of the chestnut oak, as well as the chestnut tree proper, and is extracting the tannic acid required in the leather business by equipment which includes boilers, tanks and distilling equipment generally. That opens another avenue for the consumption of machinery, although at present it is not a large one.

This rapid survey of the situation in the forest products field is meant to show that conditions there are less stable, perhaps, than in any other industry. It is generally rated the third in importance in the United States; and consequently the manufacturer of power equipment as well as machinery of the kinds noted can study developments to his immediate and lasting advantage.

Gas Utilization at the Caen Steel Works

An interesting utilization of gas products is to be tried in connection with the steel works at Caen, in Calvados, about 125 miles northwest of Paris, France. The steel works are to have blast furnaces of an individual capacity of 375 to 400 tons a day, and the initial development of the work comprehends an annual production of 300,000 tons with two blast furnaces, though the plant in its entirety calls finally for six blast furnaces. The steel works will obtain practically all the power required by utilizing the gas from the blast furnaces and the gas from the coke ovens. The power plant, which will employ gas engines, will have also to supply the railroad to the nearby mine, as well as the mine itself, sending to the mine as much power as possible to minimize hand labor. The estimate indicates a total production of 20,000 kw., for a production of 800 tons of iron per day, the contemplated scale of operations at the outset.

One of the interesting points in connection with the installation of the gas engines, as mentioned recently in *Le Genie Civil*, is that a steam-driven turbo-alternator is to be provided to take the peak power demands and save the gas engines from an otherwise variable and trying load. Another interesting point is that this auxiliary turbine unit is to be supplied with steam from boilers utilizing the heat of the exhaust gases from the gas engine and thus without any expense on account of fuel. The belief is that the gas engines will be able to operate normally at a load close to the full capacity, and that the turbo-alternator will also serve during construction to provide the electric energy necessary for lighting and general construction work. About October of this year, it is expected to furnish to the mines of Soumont the power necessary to get the ore ready for the steel works.

It is realized that in a steel works of the size of those of Caen, the possible stoppage of the supply of gas from either of the two gas furnaces is sure to have a disturbing influence on the power station. Two methods present themselves to overcome this difficulty, one to provide gas engines capable of operating on blast furnace gas or coke oven gas interchangeably and in the case of a stoppage in the supply of the blast furnace gas of utilizing producer gas, or better, providing for a mixture of the coke oven and blast furnace gas, which will give a gas of about 135 B. t. u. per cubic foot, comparable to the gas from a producer.

The average load on the switchboard of the works will not exceed, it is estimated, 21,000 kw. This power is to be supplied from six alternators of 4000-kw. capacity, the sixth unit installed as a reserve, and in addition there is a turbo-alternator of 3000-kw. capacity, capable of 4000 kw. for one half hour. The power available from the gas represents, as stated, 30,000 kw., so that, taking account of the power required for blowing purposes, it is expected that there will be an excess. The current will be three-phase at 5000 volts and 50 cycles, with transformation to low voltage for the smaller motors.

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Delayed Deliveries

Some causes of delay in the delivery of *The Iron Age* have been reported in the past two weeks. There has been no failure at this office to meet our mail schedules, but investigation shows some irregularity in the postal service due to the quadrennial weighing of all second-class matter. Measures have been taken to obviate further delay, but we shall appreciate reports from subscribers who do not receive their copies at the usual time.

Quick Action Desirable on Tariff Revision

Washington advices indicate that a new plan is to be put in effect in revising the tariff at the approaching session of Congress. It is expected that as soon as the bill prepared by the Ways and Means Committee is reported to the House of Representatives, the chairman of the Finance Committee of the Senate will call a meeting of his committee and begin informal consideration of the various schedules. This will take place while the bill is receiving attention in the House and making progress on its passage. The Finance Committee will thus be at work several weeks earlier than would otherwise be the case. If the members of the Finance Committee discover items regarding which they differ seriously with the House provisions, advice regarding this difference will be communicated to the members of the Ways and Means Committee in charge of the bill in the House. It is hoped in this way that amendments may be effected in the House to bring the bill nearer the wishes of the majority of the Senate. Minor differences, of course, will be left to conference after both bodies have acted. It would appear from this that the likelihood of serious differences will be greatly minimized.

If such a programme as this can be carried through, the time required for the enactment of a tariff bill will be greatly reduced from that occupied in previous efforts of the kind. One of the most serious accompaniments of past experiences in tariff revision has been the protracted uncertainty as to the rates to be finally adopted which more or less affected general business. It was not so much the probability of reductions in rates that impelled manufacturers and merchants to proceed conservatively as the prolongation of the period under which the rates were being considered. There have been experiences of this kind when the greater part of a year elapsed from the time that a tariff bill made its appearance in the House of Representatives until the act was signed by the President. Even when it was known that a bill would advance quite a number of rates the effect on business of the prolonged uncertainty regarding what the rates would really be was almost as serious as when it was known that rates would be greatly reduced.

It is, of course, to be hoped that the tariff revisionists may not reduce duties so seriously as to hurt important industries. Intimations are given that the majority in Congress does not intend to act radically in this matter. Nevertheless, no one is in position to promise that any particular policy will not only be agreed upon but faithfully carried out. Sometimes conditions develop which are beyond the power of the most capable leaders to control. Whether the duties are to be considerably reduced or scaled down moderately, the country will be far better satisfied to have the agony of the tariff revision over within a reasonable time.

It is protracted uncertainty that causes more trouble to business men than an actual change in the rates of duties affecting their products.

Mutual Accident Liability Insurance

While mutual liability insurance has been given wide and favorable discussion in connection with workmen's compensation, American legislative bodies as a rule have neglected to include the principle in the laws they have enacted. To-day insurance against loss by accident to workmen must be in a company which is directly under State control, or in one of the private companies which make a business of handling these risks. In some cases responsible owners are permitted to carry their own insurance, but the mutual plan has failed to become an active factor in the new form of employers' liability.

Mutual insurance has many warm advocates among manufacturers, especially those who insure their plants in the fire mutuals. Under the system followed by the latter, no uniform rate prevails. The premium paid by different works varies with the degree of fire hazard. In the first place, the mutuals will accept no insurance unless the property is safeguarded to conform strictly with their rules. Before a policy is written, inspectors go over the plant and report as to changes which should be made and the fire prevention and fire fighting equipment which should be installed. The owner is notified of these requirements, and if he conforms to them he may become a member of the mutual organization. If his buildings are strictly fireproof and their contents of a non-inflammable character, or if protection is otherwise of the highest class, his rate is very low, and the rate scale ascends until the established limit of hazard is reached, below which property is non-insurable.

The inspectors for the fire mutuals are constantly alert to any backsliding in the matter of risks, and are watchful for further improvements, and the owners must obey the mandates which come from the company as a consequence of these suggestions, on penalty of cancellation of their policies. Rates decrease with the risks; the insured therefore undergoes no hardship. The insured property is confined to selected hazards. Rebates of premiums are paid the policy holders when the aggregate losses incurred by the company are less than the fixed maximum. In practice, it has been found by many owners that the continued improvements to a plant in connection with the insurance has an important influence in other ways than reducing the danger of fire, notably in an increased production due to the improved environment of employees.

That a similar system would work out with most satisfactory results in workmen's compensation is not difficult to realize. The mutual liability insurance company would select its risks only after a careful inspection of plants which would ascertain the degree of menace to workmen that might exist in connection with machinery and other equipment, and because of general shop conditions. The applicant would be notified that certain changes must be made before a policy would be issued to him. Gears must be covered and belts boxed in; additional lights must be installed, the better to illuminate areas which are dangerous because of their darkness; gallery platforms must have railings, and so on through every detail.

The owner of an industrial plant must be governed

under workmen's compensation by the two considerations of philanthropic regard for his employees and of the danger of financial loss to which he may be subjected as the result of accident. If he were to carry his own insurance, assuming all risks himself, naturally he would go to great pains to reduce the danger of injury to his people. On the other hand, if he were to insure in a company which does not insist upon extreme care regarding the risk to employees, he would, generally speaking, give much less time and trouble to the subject. This is human nature. There are plenty of exceptions to the rule but nevertheless the condition exists. A large percentage of owners need just such a spur as that which mutual insurance would apply.

Under existing laws, risks can be classified to a certain extent as between the different industries. But the classifications can never be fair. The owner who takes an active interest in providing safety devices of every description, spending large sums of money for the purpose, and increasing his investment correspondingly, has small advantage in the matter of insurance over his competitor who is wholly indifferent to this form of improvement. The mutual plan tends toward fair play. The employer who would do the most in rendering his shop proof against accident would have as his reward a saving in the insurance account.

Probably nothing could result in a more important advance in the campaign, already well started in America, toward safeguarding employees, than the adoption of a scientifically worked out insurance system under which the companies would compel the installation of every modern means of rendering equipment fool proof. At any rate this is the opinion of practically everybody who has to do with mutual fire insurance. The plan could be amplified, as in fire insurance, by subdividing business among companies, each of which would represent an industry.

Acoustics of Industrial Buildings

The acoustic properties of manufacturing buildings have been given little consideration except by a few professional mill engineers. The subject is one of some importance. As is well established, unnecessary noise is undesirable in any place where men and women are employed. Each industry has its individual amount of normal noise, but one boiler shop may be noisier than another, and one machine shop worse than its neighbor of similar size and equipment. The great factor is the machinery, as in the case of a shrieking planer belt. But the room itself may tend to the magnifying of sound, and in designing a factory the engineers should take the fact into careful account. Scientific data are available; acoustics has been well worked out in connection with architecture.

In a recent case a company moved its offices into a new building, and the stenographers who had previously been grouped in a large room were established similarly in new quarters. Their efficiency fell off at least 50 per cent. according to the records. They urged that they could not work well because of the noise of their machines, the number of which was no greater than formerly. The room reverberated with the clicking, creating an annoying and nerve-racking din. The conditions were studied by a man having some knowledge of acoustics and he quickly found the remedy. Fine piano wires were strung across the room some three

feet below the ceiling and several feet apart. The troublesome vibrations disappeared, broken up by the wires, and the room resumed a normal condition. Most large rooms are full of echoes, as long as they are empty. In homes, rugs, draperies and curtains are important modifying elements in connection with sound. In manufacturing rooms the overhead belts have the tendency to break up vibrations. When a factory room is well filled with equipment and materials, and has shafting and belts overhead and curtains at the windows, there is small trouble from magnified sound. But when a room is empty, except for the space near the floor, the echoing vibrations may prove decidedly objectionable.

Standardizing Workmen's Compensation

Workmen's compensation in the United States is in an exceedingly chaotic condition. Nearly every State has either passed a law or is about to do so, establishing the system of compulsory payment of damages to men and women who are injured in the course of their employment. The laws are not at all alike and are far from perfect. They are not clearly drawn and are a prolific source of controversy. They have not resulted in the expected benefit of eliminating the lawyer from the procedure of compensating the injured. Where business is carried on by a company in more than one State the problem of insurance against liability is the cause of much dissension and of much complication. If a workman employed in New York State is sent to do some work in New Jersey the compensation comes under the laws of the latter State because of the established principle that the laws in the place where an accident occurs must prevail and not those of the place where the contract of employment is made. Some of the large companies send men into many States and only most expert knowledge of the various acts will solve the intricacies involved. Private compensation systems which have worked effectively, and to the complete satisfaction of the workman, have been legally discountenanced even though their terms were more generous than those named by act of legislature.

One great trouble is that each State has attacked the problem in its own way. While advantage has been taken of laws already enacted by other States and by various European countries, each succeeding State law is still built up to a large extent on the theories of its own people. A good deal of law has been made which is not sound, and some of it has been found to be unconstitutional. The work already done by investigators, legislatures and courts would seem to make it comparatively simple to frame an act, were not the material at hand so involved in contradictions and opposing theories. In the States where legislatures are now at work on workmen's compensation it is known that proposals are seriously considered which have been found unsatisfactory elsewhere.

In Connecticut, for example, half a dozen bills are now under consideration by the legislature, several of them embodying undesirable, and even dangerous provisions. At the hearings the results of the several investigations by competent commissions, including the Committee on Uniformity of Laws of the American Bar Association, were brought out in copious detail. Nevertheless, certain features of several of the bills are wholly antagonistic to the findings of these capable

bodies of experts. Fortunately, most of the principles advocated by the demagogues are unconstitutional. The labor interests are keen to embody the salient features of the Ohio and Washington acts, which are not proving practical and are unpopular both with the employers and the workmen. But Connecticut manufacturers took time by the forelock and gave the question much study in the interval since the legislative session of two years ago, when a wholly bad bill was defeated by a narrow margin. Doubtless in the present instance their wiser counsel will prevail. The situation is typical, and proves the advantages which must accrue where those whose interests are affected take active part in the preliminary work, instead of leaving it to the few. In none of the States is the law perfect. In most of them it needs a vast amount of improvement. Amendment must be made everywhere to a greater or less degree. To accomplish this wisely is a labor in which all employers should join.

Correspondence

How to Advertise for High-Grade Men

To the Editor:—An extremely common complaint by those who have positions to fill is that they can obtain high-grade men only after much difficulty. Ask any employer what his experience is in filling positions demanding ability and training, and almost invariably the reply will be substantially as one puts it from his experience as follows: "Good help is hard to get. I advertise for a technical man to take a responsible position and receive hundreds of replies. Most of them are obviously from parties who cannot be considered for an instant. Further investigation shows that all or nearly all the remainder are unsuited for the work. I have interviews with a few who seem likely to meet my requirements, and find it necessary to reject them all and advertise again. And the same results follow. When I do finally engage an applicant, it is with much misgiving. Sometimes he proves equal to the opportunity, but more frequently he does not."

As one who has played on both sides of the employment game, I might relate some strange stories of the difficulties in getting a good man and a good position together, but such is not my purpose. I desire merely to suggest at least one cause why "good men are hard to get." That cause is not at all creditable to the employer who is prone to make this complaint, but experience and observation leave little doubt in the writer's mind that the employer himself is in a considerable measure responsible for his own perplexities.

It is wise to be frank about a matter of such general interest. Why is it that the best positions so often go begging? Largely because the task of filling them is in the hands of men who treat the matter from the wrong viewpoint. Their attitude repels the "good man" whom they must find. They demand more at the outset than a really desirable man can afford to yield, and so have little success in locating him. But let us speak in more concrete terms.

Mr. Smith finds that he must have the services of a designer of marine engines. So he inserts an advertisement in a trade journal reading somewhat like this:

WANTED—A draftsman with marine-engine experience. Must be a competent designer. Give age, experience, and references in full. Address X Y Z, care *The Iron Age*.

Now, when the "good man" whom Mr. Smith is seeking reads this advertisement, he imagines he would like the position, but is confronted at once by peculiar difficulties. There is no hint of the location, while he must know where the position would take him. No mention is made of salary. In fact, there is nothing on which he can base an estimate of the desirability of the position. But, worst of all, his references are demanded, and our "good man" does not feel disposed to go to such a length before he knows whether or not he can accept the position. Mr.

Smith has not considered the important fact that a salaried man's references are his best asset, and that the "good man" he wants can ill afford to trouble past employers for nothing. So the "good man" perceives no way out of the dilemma. He reflects on the plan of addressing the advertiser and asking for information, or requesting an interview, but finally rejects it, since experience has taught him that such a letter to such a man as the advertiser evidently is will not be answered, and so Mr. Smith and our "good man" remain strangers.

But Mr. Smith does get many replies notwithstanding. Scores of recent graduates, apprentices, draftsmen of low ability, tracers, and even those making no pretense to drafting-room experience of any kind waste their time and his trying for the position. Of course, Mr. Smith is exasperated and denounces the general inefficiency of mankind.

The truth which an advertiser of this character fails to grasp is that really valuable men do not rise to the bait so easily as he imagines they should. He seems to think that the fact of his having the position to offer makes him master of the situation, and is little concerned with satisfying the applicant. He expects only that the applicant shall satisfy him. And only applicants who have nothing to lose will attempt to do so. The kind of an advertisement Mr. Smith should have inserted may be worded thus:

WANTED—A marine-engine designer. Location, Philadelphia. Permanent position for the right man. For interview address X Y Z, care *The Iron Age*.

Such an advertisement appeals at once to a high-grade man willing to make a change. So the advertiser gets a few applications which he may consider among the scores which he cannot. The writer has made use of your classified advertisements to his profit, and in attempting to reveal one cause of failure in filling high-grade positions promptly has sought to enhance their usefulness. C. R. M.

LIMA, OHIO, March 20, 1913.

Book Reviews

Export Manual. Suggestions for the Manufacturer or Sales Manager in Handling Export Trade. Pages, 96, 4 x 9 in. Compiled and published by R. L. Ardrey, 76 West Monroe street, Chicago. Price \$1.

This work has been prepared for the purpose of giving in compact form the business details of export trade, comprising data that manufacturers have frequently found it difficult to obtain. The inland manufacturer will be especially interested in the particulars given in relation to shipping charges and the clearing of export shipments through New York. The author states that great care was taken in the preparation of the matter to insure its correctness. Proofs were submitted to the foreign managers of leading banks, to the export officials of railroads and to other people who know the ins and outs of the export trade and their corrections were carefully checked. He has the assurance from the railroads that there is "tariff authority" for every statement he makes. Interesting chapters are given on export credit and banking, information having been obtained from practical bankers of London experience regarding European methods of financing exports, rates of interest which manufacturers pay in Europe, etc. The effort has been made to cover all points that may be desired by manufacturers who are seeking to develop an export trade.

Selected Standard Specifications for Steel and Steel Products. Cloth bound. Pages, 109, 6 x 9 in. Published by the American Society for Testing Materials. Price, \$3.

Twenty standard specifications for steel products originally prepared by Committee A-1 of the American Society for Testing Materials are brought together in this volume and are given in English, German, French and Spanish. In the preface attention is called to the wide recognition of the specifications of the society as thoroughly representative specifications for all materials to which they apply and to the fact that they have come into extensive use. The United States Government has adopted them for material entering into the construction of the Panama Canal and for material used in the manufacture of postal cars. The issuance of the specifications in three foreign languages, it is stated, is partly with a view to meeting the

desires of many members of the American society who wish to make these specifications known in foreign countries, and partly in view of the resolution relating to specifications adopted at the sixth congress of the International Society for Testing Materials, held in New York in September, 1912. That resolution, it may be recalled, referred to the difficulties of preparing international specifications and recommended that the committees on standard specifications for steel and steel products and for cast iron and cast-iron products continue their work by the collection and dissemination of information in regard to modifications in the specifications of the different countries.

The preface, which is signed by President Robert W. Hunt and Secretary Edgar Marburg, expresses the hope in conclusion "that the example of America in having 20 of the principal standard specifications for steel products printed in four languages, partly with a view to carrying out the terms of this resolution [referred to above] will be emulated in other leading countries."

The 20 specifications in any one of the four languages can be obtained in a separate pamphlet at a cost of \$1.

An Outline of the Metallurgy of Iron and Steel. By A. Humboldt Sexton. Pages, xv + 572, 6 x 8 3/4 in. Published by the Scientific Publishing Company, Manchester, England. Price, 12s. 6d.

This work was popular enough in England to cause a demand for this second edition. It is intended primarily for a textbook and it differs from the first edition only in that it has been brought up to date. The metallography and heat treatment of steel have been given considerable attention, but the details of the present status and application of electric furnace are not as numerous as might be wished. The duplex process for steel making is not mentioned by name, but there is a general statement under "Modified Methods of Working" that such methods "as the combination of the converter and the open hearth have never come into use to any extent." The author presumably refers only to England. There is a long chapter on "Resisting of Iron and Steel." In the discussion of "Special Steels," no mention is made of titanium and the information about vanadium is far from being up to date.

Iron Making in Alabama. By William Battle Phillips. Pages, 254, 6 1/4 x 9 1/4. Third edition. Published as a report of the Geological Survey of Alabama, by Eugene A. Smith, State geologist.

This book has reached its third edition because of the valuable information it contains concerning the various ore deposits of Alabama and the method of using these ores. The first two chapters are taken up with a complete discussion of the various ores, their location and composition. Then follows a chapter on concentration of ores, with others on fluxes, fuels, coke furnaces and charcoal furnaces. The chapter on "Steel Making in Alabama," by Frank H. Crockard, is of particular interest. It has already been reproduced in these columns. There is also a chapter devoted to a description of the rolling mills and basic open-hearth steel works of the district. The book is effectively illustrated with views of various mines, rolling mills and other plants.

A British "Revolution" in Steel-Making

Another "revolution" in the iron industry is now attracting attention in Great Britain. Details are not available beyond the report cabled this week that the process "reduces iron ore of any grade, including iron sands, producing steel at a single operation. No blast furnace or coke is required. The reducing agent is gas. The steel is claimed to be produced at one-third the present cost." This all sounds much like the claims made in the United States a few years ago for the process exploited by the — Steel Company ("100,000 shares, par value \$5 each, full paid and non-assessable") which was to work directly from the ore and abolish the blast furnace and existing steel works, since "iron and steel makers will have no use for the Bessemer or the open-hearth plants when they can install the — process for one-tenth the cost of the present style of blast furnaces and produce pure wrought iron and crucible steel for one-half the money it costs them now." The new British process goes all this one better in dividing present costs by three.

The Iron and Metal Markets

Floods Cut Down Output

March Operations at a Record Rate

Easier Delivery Conditions in Some Lines— Basic Pig Iron More Active

The disastrous floods in the Central West have done their chief damage west of Pennsylvania. Pittsburgh iron and steel works are not affected and probably will not be, and works in the Wheeling district are running as usual, but in the Shenango Valley and at Youngstown, Cleveland, Columbus and other Ohio cities blast furnaces have had to bank, and a number of steel works and rolling mills have been shut down.

The Steel Corporation for most of this month has been turning out finished material at the remarkable rate of 46,000 tons a day. All other steel companies have exceeded their best records. The flood has checked this record-making, but by another 24 hours it is expected that most of the inundated plants will be running again.

In the general situation the chief feature is the easier delivery conditions in a number of products, particularly sheets and plates. The premiums which to a good many consumers have been for some months the regular price on much they have bought, are disappearing. Thus an impression of an easier market is given; but there is nothing of this sort in ordinary contract business.

In the case of sheets, a number of mills have been devoting themselves to prompt shipment trade at \$3 to \$5 a ton above the contract market. These are now selling at the regular basis and some of them have shaded it. But there is no such supply of steel as to permit any real sagging in sheets.

The one transaction reported last week in bars for implement works still stands alone so far as concerns contracts for six months or a year from July 1. The largest agricultural buyers are making no haste to buy at 1.40c. in spite of the crowded order books of the bar and bar shape mills.

The advance of \$1 a ton in wire products announced by leading manufacturers as effective late last week brings plain wire to \$1.60 and wire nails to \$1.80. As there was no heavy buying at the last \$1 advance, which was made on December 16, the step just taken is considered a tactical one and intended to stimulate specifications on the \$1.50 and \$1.55 business now on the books.

A 50,000-ton order of the St. Paul railroad for Bessemer rails, announced this week, is in addition to a contract made last year. The Seaboard Air Line has taken 10,000 tons of open-hearth rails. At Buffalo the International Railway Company has placed 2000 tons with the local mill and 4500 tons of girder rails with the mill at Lorain, Ohio. There is still some serious figuring on cars, though nothing can be had until near the end of the year. Car companies have yet to buy a good deal of material for this year.

It is still the case that the specifications going to the large steel companies for plates, shapes and bars are in excess of shipments. The coming on of the spring demand, which must always be reckoned with, raises a question as to sources of supply. The mills in the heavy lines can do little short of the third quarter,

while jobbers, who are now getting fair shipments from mills, have been unable to accumulate stock.

Running under pressure, the steel companies have not thought much of the tariff as a 1913 factor. Evidently seaboard users of tin plate are buying carefully, with an eye to the possibilities of a 20 per cent. ad valorem rate, which would mean 70 or 80 cents duty per box on to-day's prices, instead of \$1.20. The expected placing of cotton ties on the free list has kept some manufacturers from rolling the usual advance supply of that product. European mills could help out but little in case of a shortage.

The basic pig-iron market has grown active, and considerable business is ahead. A Pittsburgh steel company bought 15,000 tons at \$16 at Valley furnace, and an equal amount was taken by another company for second and third quarters at slightly less. A third buyer has increased its recent purchases to 12,500 tons and there are inquiries for 5000 and 7500 tons. A large buyer has contracted for 6000 tons a month over the remainder of the year.

In foundry iron weakness grows more marked as buyers wait. Southern iron is more generally sold by furnaces at \$13 Birmingham for No. 2 and there have been sales at \$12.75. In the Central West the selling by Cleveland furnaces in Pittsburgh territory has been more aggressive, and No. 2 foundry iron has gone below \$16.25 Valley furnace.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Mar. 26, 1913.	Mar. 19, 1913.	Feb. 26, 1913.	Mar. 27, 1912.
Pig Iron, Per Gross Ton:				
Foundry No. 2 X, Philadelphia	\$17.75	\$17.75	\$18.00	\$15.00
Foundry No. 2, Valley furnace	16.25	16.50	17.00	13.25
Foundry No. 2, S'th'n, Cin'ti...	16.25	16.25	16.50	13.50
Foundry No. 2, Birmingham, Ala.	13.00	13.00	13.25	10.25
Foundry No. 2, furnace, Chicago*	17.25	17.25	17.25	14.00
Basic, delivered, eastern Pa....	17.50	17.50	18.00	14.50
Basic, Valley furnace.....	16.00	16.10	16.25	13.00
Bessemer, Pittsburgh.....	18.15	18.15	18.15	15.15
Malleable Bessemer, Chicago*	17.25	17.25	17.25	14.00
Gray forge, Pittsburgh.....	16.75	16.90	17.15	13.65
Lake Superior charcoal, Chicago	18.00	18.00	18.00	15.75
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh....	28.50	28.50	28.50	20.00
Open-hearth billets, Pittsburgh.	29.00	29.00	29.00	20.00
Forging billets, Pittsburgh....	36.00	36.00	36.00	26.50
Open-hearth billets, Philadelphia	30.00	32.00	32.00	22.40
Wire rods, Pittsburgh.....	30.00	30.00	30.00	25.00
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	16.25	16.25	16.25	15.25
Iron rails, Philadelphia.....	18.00	18.00	18.00	15.50
Carwheels, Chicago.....	16.75	16.75	16.75	13.00
Carwheels, Philadelphia.....	15.00	15.00	15.00	12.50
Heavy steel scrap, Pittsburgh..	14.25	14.25	14.00	13.00
Heavy steel scrap, Chicago.....	12.25	12.25	12.00	10.75
Heavy steel scrap, Philadelphia.	13.50	13.50	12.50	12.00

Finished Iron and Steel,

	Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25	
Iron bars, Philadelphia.....	1.67½	1.67½	1.67½	1.22½	
Iron bars, Pittsburgh.....	1.70	1.70	1.70	1.25	
Iron bars, Chicago.....	1.57½	1.57½	1.57½	1.15	
Steel bars, Pittsburgh, future..	1.40	1.40	1.40	1.10	
Steel bars, Pittsburgh, prompt..	1.85	1.85	1.70	1.10	
Steel bars, New York, future...	1.56	1.56	1.56	1.26	
Steel bars, New York, prompt..	2.01	2.01	1.86	1.26	
Tank plates, Pittsburgh, future.	1.45	1.45	1.45	1.15	
Tank plates, Pittsburgh, prompt.	1.70	1.70	1.70	1.15	
Tank plates, New York, future..	1.61	1.61	1.61	1.31	
Tank plates, New York, prompt.	1.76	1.76	1.86	1.31	
Beams, Pittsburgh, future.....	1.45	1.45	1.45	1.15	
Beams, Pittsburgh, prompt.....	1.70	1.70	1.70	1.15	
Beams, New York, future.....	1.61	1.61	1.61	1.31	
Beams, New York, prompt.....	1.76	1.86	1.86	1.31	
Angles, Pittsburgh, future.....	1.45	1.45	1.45	1.15	
Angles, Pittsburgh, prompt.....	1.70	1.70	1.70	1.15	
Angles, New York, future.....	1.61	1.61	1.61	1.31	
Angles, New York, prompt....	1.76	1.86	1.86	1.31	
Skelp, grooved steel, Pittsburgh	1.45	1.45	1.45	1.10	
Skelp, sheared steel, Pittsburgh	1.50	1.50	1.50	1.15	
Steel hoops, Pittsburgh.....	1.60	1.60	1.60	1.25	

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

	Mar. 26, 1913.	Mar. 19, 1913.	Feb. 26, 1913.	Mar. 27, 1913.
Sheets, Nails and Wire,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.35	2.35	2.35	1.80
Wire nails, Pittsburgh.....	1.80	1.75	1.75	1.60
Cut nails, f.o.b. Eastern mills..	1.80	1.80	1.80	...
Cut nails, Pittsburgh.....	1.70	1.70	1.70	1.55
Fence wire, ann'd, 0 to 9, Pgh.	1.60	1.55	1.55	1.40
Barb wire, galv., Pittsburgh....	2.20	2.15	2.15	1.90

Coke, Connellsville, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	\$2.30	\$2.40	\$2.35	\$2.25
Furnace coke, future delivery..	2.50	2.50	2.50	2.25
Foundry coke, prompt shipment	3.00	3.00	3.00	2.75
Foundry coke, future delivery..	3.00	3.00	3.00	2.50

Metals,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	15.00	15.00	15.00	15.50
Electrolytic copper, New York..	14.87½	14.87½	14.75	15.37½
Spelter, St. Louis.....	6.05	6.15	6.10	6.60
Spelter, New York.....	6.20	6.30	6.25	6.75
Lead, St. Louis.....	4.20	4.20	4.20	4.12½
Lead, New York.....	4.35	4.35	4.35	4.20
Tin, New York.....	40.75	45.87½	48.50	43.37½
Antimony, Hallett, New York..	8.50	8.50	8.62½	7.75
Tin plate, 100-lb. box, Pittsburgh	\$3.60	\$3.60	\$3.60	\$3.30

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.45c. to 1.70c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Extras.	
Gauges under ¼ in. to and including 3-16 in.....	.10
Gauges under 3-16 in. to and including No. 2.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and tees, 3 in. and over, 1.45c. to 1.70c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.....	.10
H-beams over 18 in.....	.10
Angles over 6 in. on one or both legs.....	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, hand rail, car-truck and conductor rail).....	.05
Angles, channels and tees, under 3 in. wide as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles.....	.30
Hand rail tees.....	.75
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55
No charge for cutting to lengths 3 ft. and over.	

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, \$30. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.60; galvanized, \$2. Galvanized barb wire, to jobbers, \$2.20; painted, \$1.80. Wire nails, to jobbers, \$1.80.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

	Plain Wire, per 100 lb.							
Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....	\$1.75	\$1.80	\$1.85	\$1.90	\$2.00	\$2.10	\$2.20	\$2.30
Galvanized.....	2.15	2.20	2.25	2.30	2.40	2.50	2.90	3.00

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (full weight) in effect from January 1, 1913, iron pipe (full weight), from October 21, 1912:

Steel.			Butt Weld.			Iron.		
Inches.	Black.	Galv.	Inches.	Black.	Galv.	Inches.	Black.	Galv.
¾, 1 and 1½.....	73	52½	¾ and 1.....	67	48	¾, 1 and 1½.....	67	48
1½.....	77	66½	1½.....	66	47	1½.....	66	47
¾ to 3.....	80	71½	¾ to 2½.....	70	57	¾ to 2½.....	70	57
			¾ to 2½.....	73	62			
2.....	77	68½	1½.....	57	46			
2½ to 6.....	79	70½	1½.....	68	57			
7 to 12.....	76	65½	2.....	69	59			
13 to 15.....	53	..	2½ to 4.....	71	62			
			4½ to 6.....	71	62			
			7 to 12.....	69	56			

Plugged and Reamed.			Lap Weld.		
1 to 3, butt.....	78	69½	1½.....	57	46
2, lap.....	75	66½	1½.....	68	57
2½ to 4, lap.....	77	68½	2.....	69	59
			2½ to 4.....	71	62
			4½ to 6.....	71	62
			7 to 12.....	69	56

Butt Weld, extra strong, plain ends.			Lap Weld, extra strong, plain ends.		
¾, 1 and 1½.....	68	57½	1½.....	66	60
1½.....	73	66½	2.....	67	59
¾ to 1½.....	77	70½	2½ to 4.....	71	62
2 to 3.....	78	71½	4½ to 6.....	70	61
			7 and 8.....	64	54
			9 to 12.....	59	48

Butt Weld, double extra strong, plain ends.			Lap Weld, double extra strong, plain ends.		
¾.....	63	56½	1½.....	56	50
¾ to 1½.....	66	59½	2.....	61	55
2 to 2½.....	68	61½	2½ to 4.....	60	54
			4½ to 6.....	53	43
			7 to 8.....	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers in carloads on lap-welded steel, in effect from February 1, 1913, and standard charcoal iron boiler tubes, in effect from January 1, 1913, are as follows:

Lap Welded Steel.		Standard Charcoal Iron.	
1½ and 2 in.....	60	1½ in.....	44
2½ in.....	57	1½ and 2 in.....	48
2½ and 3½ in.....	63	2½ in.....	44
3 and 3½ in.....	68	2½ to 3½ in.....	53
3½ to 4½ in.....	70	3 and 3½ in.....	55
5 and 6 in.....	63	3½ to 4½ in.....	58
7 to 13 in.....	60	Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent net extra.
3½ in. and larger, over 22 ft., 10 per cent net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.		Box Annealed Sheets, Cold Rolled.	
Nos.	3 to 8	Nos.	10 and 11
Nos. 9 and 10.....	1.70	No. 12.....	2.00
Nos. 11 and 12.....	1.75	Nos. 13 and 14.....	2.00
Nos. 13 and 14.....	1.80	Nos. 15 and 16.....	2.05
Nos. 15 and 16.....	1.85	Nos. 17 to 21.....	2.10
	1.95	Nos. 22 and 24.....	2.15
		Nos. 25 and 26.....	2.20
		No. 27.....	2.25
		No. 28.....	2.30
		No. 29.....	2.35
		No. 30.....	2.40
			2.50

Galvanized Sheets of Black Sheet Gauge.

	Cents per lb.
Nos. 10 and 11	2.50
No. 12	2.60
Nos. 13 and 14	2.60
Nos. 15 and 16	2.75
Nos. 17 to 21	2.90
Nos. 22 and 24	3.05
Nos. 25 and 26	3.20
No. 27	3.35
No. 28	3.50
No. 29	3.65
No. 30	3.80

Pittsburgh

PITTSBURGH, PA., March 25, 1913.

Heavy rains have caused numerous washouts on the various railroad lines serving New Castle, Youngstown and other manufacturing points in the valleys, and many blast furnaces and steel works are out of commission. They may be idle for two or three days. All the blast furnaces of the Republic Iron & Steel Company, Carnegie Steel Company and Youngstown Sheet & Tube Company at Youngstown, together with their steel departments and finishing plants, are shut down wholly or partly, and a great deal of damage has been done. All the tin plate mills of the American Sheet & Tin Plate Company in the New Castle and Sharon districts are idle at this writing on account of the floods. The same flood condition exists in the Wheeling district, and manufacturing plants located along the Ohio River between Wheeling and Cincinnati will no doubt suffer heavily in the next few days. In Pittsburgh the Monongahela and Allegheny rivers are rising rapidly, and it is probable that within 24 hours many manufacturing plants along these rivers will have to shut down because of high water. This will result in the loss of two or three days' output of steel and finished material by the mills located in the affected districts and it will be seriously felt. Other developments during the week have been of an encouraging nature and the local situation in steel looks better to-day than a week or two ago. There has been a fairly heavy buying movement in basic pig iron, but some relatively low prices have been made. Heavy purchases of scrap offered by railroads have been a feature of the week, and the scrap trade is showing a little betterment. The leading steel mills continue to report that specifications are still in excess of shipments, in spite of the fact that output and shipments by the mills this month will be unusually heavy. Prices seem to be fairly firm, but there is occasional light shading on two or three lines of finished material by mills that did not take contracts ahead and have latterly been selling their output at premiums, which have now disappeared. So far this has not seriously affected the market. Makers of pig iron report that consumers are specifying freely and in some cases have asked the furnaces to anticipate deliveries. The advance of \$1 a ton in wire products was expected and is generally taken as having been done to stimulate specifications in wire products which have been rather light this year. The shutdown of so many blast furnaces in the Central West on account of floods will probably throw a good deal of coke on the market.

Pig Iron.—A fairly heavy movement has occurred in basic pig iron in the past week. The Carbon Steel Company of this city has bought a total of 12,500 tons of basic, of which 2500 tons is for second quarter and about 10,000 tons for last half. Most of this business was taken by a Cleveland interest which has been an aggressive seller of basic and foundry iron in the Pittsburgh market for some time and is given the credit for causing the decline in prices on those grades. Another Cleveland interest has also been a seller of basic and foundry iron in this market. This has caused some of the Valley furnaces to seek pig-iron orders more aggressively. Inquiry is heavy. The United Steel Company, Canton, Ohio, is in the market for 5000 tons of basic for third quarter, and a large Eastern consumer is inquiring for 8000 to 10,000 tons of basic for delivery over four months commencing with May. The American Steel Foundries is asking prices on 2500 tons of basic per month for second quarter for delivery at its Sharon, Pa., and Alliance, Ohio, works. A leading local steel company bought last week 15,000 tons of basic for second quarter at \$16, Valley furnace, and another has bought the same tonnage for second and third quarters, at a price reported somewhat lower than \$16. A leading consumer of basic has contracted for 6000 tons a month over the remainder of the year, the business having been taken by a Valley furnace interest. The Westinghouse Machine Company is inquiring for 1000 tons of high-grade foundry iron for delivery at its Buffalo works, and

another consumer is reported in the market for 2500 tons of foundry for second and third quarters. We note a sale of 2000 tons of Bessemer iron for second quarter at \$17.25, Valley furnace, and 300 tons for April delivery at the same price. We also note a sale of 500 tons of high-grade No. 2 foundry iron for second quarter at \$16.50, Valley furnace, and sales of smaller lots ranging from 100 tons and over at \$16.25 to \$16.50. We quote standard Bessemer iron at \$17.25; malleable Bessemer, \$16.50, or perhaps lower on a firm offer; basic, \$16; No. 2 foundry, \$16.25 to \$16.50; gray forge, \$15.85, all f.o.b. cars Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—Leading sheet and tin-plate mills report that the shortage in supply of steel instead of improving is getting worse. The serious floods will cut down the output of steel this week materially. The report that the Carnegie Steel Company had bought another large tonnage of billets from the Standard Steel Company, Birmingham, Ala., is incorrect. Negotiations were in progress, with the expectation of shipping pig iron from the blast furnaces of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., and have the Standard Company convert it into steel, but the Tennessee Company could not spare the metal. Small lots of billets and sheet bars are being sold by dealers to consumers for prompt shipment, and bring premiums of \$1 a ton or more over prices of steel from the mills. A sale of 800 tons of open-hearth billets is reported for April and May delivery at about \$30, Pittsburgh. Nominal quotations on steel for shipment from the mills are as follows: Bessemer billets, \$28.50 to \$29; Bessemer sheet bars, \$29 to \$29.50; open-hearth billets, \$29 to \$29.50, and open-hearth sheet bars, \$29.50 to \$30, f.o.b. mill, Pittsburgh or Youngstown. Forging billets, \$36 to \$37, and axle billets, \$34 to \$35, Pittsburgh.

Ferroalloys.—Some weakness has developed in ferromanganese for prompt delivery, consumers offering resale material on the basis of about \$63, seaboard. We note sales of three carloads, or about 90 tons, of English 80 per cent. for prompt delivery at \$63, Baltimore. There is no inquiry for round lots for forward delivery, as large consumers are well covered. We quote 80 per cent. foreign ferromanganese at \$63 to \$64, Baltimore, for prompt delivery, and for forward delivery at \$65, the freight rate for delivery in Pittsburgh district now being \$2 a ton. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$75; over 100 tons to 600 tons, \$74; over 600 tons, \$73, Pittsburgh. We quote 10 per cent. at \$24; 11 per cent., \$25; 12 per cent., \$26, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky. We quote ferrotitanium at 8c. per pound in carloads; 10c. in 2000-lb. lots and over and 12½c. in lots up to 2000 lb.

Wire Rods.—The recent advance of \$1 a ton in wire products did not apply to wire rods, which remain unchanged. New inquiry is light and specifications against contracts are only fair. We note a sale of 300 tons of open-hearth rods for April and May shipment at \$30, Pittsburgh, and we quote Bessemer, open-hearth and chain rods at that price.

Muck Bar.—Some new inquiry has come out and we note a sale of 1000 tons and another of 300 tons of strictly high grade muck bar, made from all pig iron, at \$32 per gross ton delivered at buyers' mills in the Pittsburgh district. We quote the market at that price for best grades. Eastern muck bar is being offered in this market at considerably lower prices.

Skelp.—Several fairly large inquiries are out, one for grooved steel skelp and the other for sheared iron. One maker reports a sale of 1500 tons of sheared iron plates at about 1.90c. delivered at buyer's mill, Pittsburgh district. We quote grooved skelp at 1.45c. to 1.50c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c.; sheared iron skelp, 1.85c. to 1.90c., delivered at buyers' mills in the Pittsburgh district.

Steel Rails.—The Carnegie Steel Company has taken orders for about 13,000 tons of standard sections, made up of small lots ranging from 200 to 500 tons, and also received new orders and specifications for about 3200 tons of light rails. The demand for light rails has been active for some time and one of the local mills is helping out an Eastern maker on some of its contracts. We quote splice bars at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c., and 8 and 10 lb., 1.40c., all in carload lots f.o.b. Pittsburgh.

Structural Material.—Some local work is coming out and inquiry is reported quite active. The McClintic-Marshall Construction Company has taken 3000 tons of I-beams for floors for the Hell Gate connecting

bridge, New York. The American Bridge Company has taken 4500 tons for a new structure to be erected by the Kaufmann Brothers' department store at Fifth avenue and Smithfield street in this city, 1000 tons for a steel dock for the Great Lakes Stone & Lime Company, Alpena, Mich., also 800 tons of bridge work for an Eastern railroad, and 1100 tons for another road. The Canton Bridge Company, Canton, Ohio, has taken 900 tons for new buildings for the Berger Mfg. Company at that city. Bids have been asked on 2000 to 2500 tons for the new Pantlind Hotel at Grand Rapids, Mich. The report that the Marshall Field Estate would erect a large department store on the old Cathedral site on Fifth avenue, owned by H. C. Frick, is officially denied. A local mill reports a sale of 3000 tons of plates, shapes and steel bars for delivery in the last half on the basis of 1.40c. for the bars and 1.50c. for the plates and shapes, f.o.b. Pittsburgh. We quote beams and channels up to 15 in. at 1.45c. to 1.50c. for delivery at convenience of the mill, which would be second half of this year, while small lots from warehouse for prompt delivery are bringing from 1.60c. up to 2c., depending on the size of the order and the deliveries wanted.

Plates.—New orders for steel cars have been light. The Baltimore & Ohio has placed 1000 gondolas and 350 steel underframe cars with the Standard Steel Car Company and the Pittsburgh Railways has placed 50 all-steel trailers with the same company to be built at its shops at New Castle, Pa. It is said the Grand Trunk will buy 10,000 freight cars and has active inquiries out for 3000 box cars and 1000 coal cars. The Great Northern is inquiring for 300 box cars and the Havana Central Railroad of Cuba has bought 450 box cars and 100 flat cars. An inquiry is in the market for a very large tonnage of steel plates for a water-works job in California, and the business may come to Pittsburgh mills if they can make the deliveries wanted. For some time most of the plates being sold for reasonably prompt deliveries have been coming from Eastern plate mills, and the tonnage available is larger now than for some time with the result that prices are easing off to some extent, but premiums of \$4 and higher are still being paid for plates for delivery in four weeks or longer from date of order. We quote $\frac{3}{4}$ -in. and heavier tank plate at 1.45c., Pittsburgh, for forward delivery, while for shipment in three or four weeks 1.60c. to 1.65c. is quoted for carload and larger lots, and from 1.75c. to as high as 2c. for small lots, f.o.b. Pittsburgh.

Iron and Steel Bars.—Local makers of steel bars report that, as far as their information goes, the large Western implement makers are not as yet seriously interested in their supply of steel bars for delivery over last half of this year and for the entire year beginning July. It is expected, however, that the inquiries of both implement makers and wagon builders will soon be coming along, as they will be anxious to get on the rolling schedules as soon as possible, owing to the fact that the larger steel-car mills have their output pretty well sold up to the end of the third quarter this year. The new demand for iron and steel bars continues heavy, while specifications against contracts are still coming in at an unprecedented rate. The output of iron bars is being restricted to some extent by the scarcity of puddlers, none of the puddling mills being able to run to full capacity for this reason. All indications are that the makers of iron and steel bars, with actual business already on their books and what will naturally come in, will be able to run to as full capacity as the supply of material and labor will admit over the entire year. We quote merchant steel bars at 1.40c. to 1.45c. for delivery at convenience of the mill, which would not be before third quarter, while for shipment from warehouses 1.90c. to 2c. is quoted. We quote iron bars at 1.70c. to 1.75c. for reasonably prompt delivery. Mills charge \$1 extra per ton for twisting $\frac{3}{4}$ -in. and larger steel bars and \$2 extra for $\frac{1}{2}$ to $\frac{3}{4}$ in.

Sheets.—Reports of price cutting by local mills are greatly overstated and are probably due to the fact that two or three mills that made it a practice for some months of not selling their output ahead, thus being able to obtain premiums for reasonably prompt delivery, now find that premiums have disappeared, and with very little actual business on their books are seeking orders, thus, in a few cases, being willing to shade regular prices on black and galvanized sheets about \$1 a ton. With the present heavy demand that exists for sheets, it is expected that these makers will soon be filled up for some time ahead. Other than this, the local market on sheets is strong and a heavy tonnage has been sold for delivery in third quarter. The shortage in supply of steel is still restricting output, and in addition a number of sheet mills in the Mahoning and Shenango valleys and other places west of Pittsburgh

are idle at this writing on account of the floods. We quote 1.75c. for No. 10 blue annealed; 2.35c. for No. 28 Bessemer black sheets; 3.50c. for No. 28 galvanized, and 2.30c. for No. 28 tin mill black plate. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—The power house of the Phillips Sheet & Tin Plate Company at Weirton, W. Va., has been almost totally ruined by a land slide, and its plant there, containing 20 hot mills, is idle and will probably be down for three or four weeks or longer. The company will be helped out on its contracts by three or four other tin-plate mills that will get the steel originally intended for Weirton and roll it into tin plate for the company. Its other tin mills at Steubenville, Ohio, and Clarksburg, W. Va., will be operated to their extreme capacity and the company anticipates no trouble in making deliveries on its contracts. The Demmler, Pa., works of the American Sheet & Tin Plate Company, containing 11 hot-tin mills, which has been operated only spasmodically for some years, will probably not be put in operation again. A good part of the equipment is being moved to the Sabraton plant of the company at Morgantown, W. Va., and many of the men formerly employed at Demmler will go there also. Leading tin-plate mills report that specifications against contracts are getting heavier and it is probable will continue to show an increase right along. The floods west of Pittsburgh have played havoc with operations of tin-plate mills in the affected districts, and to-day four or five of the largest mills of the American Sheet & Tin Plate Company are shut down. It is stated that regular prices are being firmly held on the small amount of new business that is being placed. The shortage of steel is being severely felt, restricting output to some extent. We quote 100-lb. cokes at \$3.60; 100-lb. ternes at \$3.45 and No. 28 black plate at \$2.30, all f.o.b. Pittsburgh.

Railroad Spikes.—Specifications from the railroads against contracts for spikes are coming in more freely. New track laying will soon commence and promises to be heavy this year. Most of the spike makers have their output sold up through second quarter or longer. There is a great scarcity in supply of small spikes, which have sold at \$2.25 or higher per 100 lb., for prompt delivery. We quote railroad spikes in base sizes, $5\frac{1}{2} \times 9/16$ in., on large contracts with the railroads, at \$1.80, while for carload lots \$1.00 is charged; small railroad and boat spikes, \$1.00 to \$2 per 100 lb., f.o.b. Pittsburgh, for forward delivery.

Shafting.—Specifications against contracts are coming in at a fairly satisfactory rate, but the new demand is light, as consumers are covered over the next three or six months. Some inquiries have been received from implement makers for their supply of shafting for the year commencing July 1, but as yet none of this business has been placed. We quote cold-rolled shafting at 58 per cent. off in carload lots, and 53 per cent. in small lots delivered in base territory, the usual slight differential over these discounts being allowed to the very largest consumers.

Bolts and Rivets.—The local market is reported to be quite firm, any shading in prices on bolts and rivets being confined to a few cases, and as yet not serious. The makers of bolts and rivets state that the deliveries of steel bars by the mills are still unsatisfactory; they are not able to obtain raw material fast enough to run to full capacity, and for this reason are slow in catching up on back deliveries. Most makers have their output sold up over the next three or four months. We quote button-head structural rivets at \$2.20 and cone-head boiler rivets at \$2.30 per 100 lb. The discounts on bolts are as follows, in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	.....80 and 10% off
Small carriage bolts, cut threads	.....75 and 5% off
Small carriage bolts, rolled threads	.....75 and 10% off
Large carriage bolts	.....70% off
Small machine bolts, cut threads	.....75 and 10% off
Small machine bolts, rolled threads	.....75, 10 and 5% off
Large machine bolts	.....70 and 7% off
Machine bolts with C.P.C. and T nuts, small	.....75 and 5% off
Machine bolts with C.P.C. and T nuts, large	.....70% off
Square hot pressed nuts, blanked and tapped	.....\$5.70 off list
Hexagon nuts	.....\$6.30 off list
C.P.C. and R. square nuts, tapped and blank	.....\$5.70 off list
Hexagon nuts, $\frac{3}{4}$ and larger	.....\$6.60 off list
Hexagon nuts smaller than $\frac{3}{4}$	.....\$7.20 off list
C.P. plain square nuts	.....\$5.20 off list
C.P. plain hexagon nuts	.....\$5.50 off list
Semi-finished hexagon nuts $\frac{3}{4}$ and larger	.....85% off
Semi-finished hex. nuts smaller than $\frac{3}{4}$	.....85 and 10% off
Rivets, $7/16 \times 6\frac{1}{2}$, smaller and shorter	.....75, 10 and 10% off
Rivets, metallic tinned, bulk	.....3% per lb. net extra
Rivets, tin plated, bulk	.....1% per lb. net extra
Rivets, metallic tinned, packages	.....70, 10 and 10% off

Hoops and Bands.—New buying is light, as most consumers are covered through second quarter and a good many contracts have recently been placed for delivery in third quarter. The mills are back in deliveries six to eight weeks and in the case of one maker about three months. We quote steel hoops at 1.60c. to 1.65c. and steel bands at 1.40c. to 1.45c., extras on the latter as per the steel bar card, these prices being for delivery at convenience of the mill. For prompt shipment premiums are being paid.

Merchant Steel.—The new demand so far this month has been heavier than in February, and shipments by the mills in March will show a large increase over last month. Specifications against contracts are coming in freely and mills are back in delivery from six to eight weeks or longer. Prices are firm and we quote: Iron finished tire, $1\frac{1}{2} \times \frac{3}{8}$ in. and larger, 1.40c. to 1.55c., base; under $1\frac{1}{2} \times \frac{3}{8}$ in., 1.55c. to 1.65c.; planished tire, 1.60c. to 1.70c.; channel tire, $\frac{3}{4}$ to $\frac{7}{8}$ and 1 in., 1.90c. to 2c.; $1\frac{1}{8}$ in. and larger, 1.80c. to 1.90c.; toe calk, 2c. to 2.10c., base; flat sleigh shoe, 1.50c. to 1.65c.; concave and convex, 1.80c. to 1.90c.; cutter shoe, tapered or bent, 2.30c. to 2.40c.; spring steel, 2c. to 2.10c.; machinery steel, smooth finish, 1.80c. to 1.85c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and $1\frac{1}{2}$ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.30c.; soft, 3.55c.; coils, hard, 3.20c.; soft, 3.45c.; freight allowed. The usual differentials apply for lighter gauges and sizes.

Wire Products.—Effective Wednesday, March 19, the Cambria Steel Company advanced prices on wire products \$1 a ton and on the following Saturday the American Steel & Wire Company and Youngstown Sheet & Tube Company took the same action. The advance had been generally expected and was no doubt made largely for the purpose of stimulating specifications on contracts taken prior to December 16 last, and which so far this year have not been coming in at a satisfactory rate. The mills state that on all new business these new prices on wire and wire nails will be strictly adhered to, but jobbers and consumers are covered for some time ahead at lower figures. We quote makers' prices to jobbers as follows: Wire nails, \$1.80 base per keg; cut nails, \$1.70 to \$1.75; galvanized barb wire, \$2.20 per 100 lb.; painted, \$1.80; annealed fence wire, \$1.60, and galvanized fence wire \$2, f.o.b. Pittsburgh, usual terms, freight added to point of delivery. Jobbers charge the usual advances over these prices for small lots from store.

Merchant Pipe.—Mills report that new orders for merchant pipe this month have been somewhat larger than in February, and shipments will also show an increase over last month. The Union Natural Gas Company has placed a contract for 73 miles of 16-in. pipe with the National Tube Company and 84 miles of 18-in. steel pipe with Spang, Chalfant & Co., Inc. This pipe will be used in laying a natural gas line from the Sugar Grove, Ohio, field to Muncie, Ind. The National Tube Company has also taken a contract for 40 miles of 6-in. for Western delivery. It is said that some relatively low prices are being made on line pipe, but that regular discounts on merchant iron and steel pipe are being quite firmly maintained.

Boiler Tubes.—The new demand for locomotive and merchant tubes continues unusually heavy. The National Tube Company has taken a contract for all the boiler tubes required for 100 locomotives for the Baltimore & Ohio railroad and 144 for the Pennsylvania railroad, the latter to be built by the Baldwin Locomotive Works at Philadelphia. The new demand and specifications against contracts for seamless tubes continue heavy, and makers are back from three to four months in deliveries. Discounts on iron and steel boiler tubes are reported firmly held.

Iron and Steel Scrap.—A local steel mill bought a very heavy tonnage of railroad scrap from the Pennsylvania Railroad recently at the reported price of \$15 delivered. It is also stated that a large interest that has not been a buyer of scrap in the open market for some months has recently bought quite a large tonnage but this report is not officially confirmed. A local consumer bought 1500 to 2000 tons of selected heavy steel scrap for which it paid \$14.50 delivered at its mills. Most of the consumers of scrap now seem to be filled up and little material is moving from dealers to the mills. Machine shop turnings appear demoralized, having sold below \$8.50 delivered. Bundled sheet scrap is also low, considerable being offered. We quote, per gross ton, delivered in the Pittsburgh and nearby districts, as follows:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	\$14.25 to \$14.50
No. 1 foundry cast	14.25 to 14.50
No. 2 foundry cast	13.25 to 13.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	10.50 to 10.75
Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.25 to 16.50
No. 1 railroad malleable stock	13.50 to 13.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	17.00 to 17.25
Iron car axles	24.25 to 24.75
Steel car axles	17.75 to 18.00
Locomotive axles, steel	21.75 to 22.00
Locomotive axles, iron	26.00 to 26.25
No. 1 busheling scrap	13.25 to 13.50
No. 2 busheling scrap	9.50 to 9.75
Old carwheels	15.75 to 16.00
*Cast-iron borings	10.00 to 10.25
*Machine shop turnings	8.50 to 8.75
†Steel bar crop ends	16.00 to 16.25
†Old iron rails	16.25 to 16.50
No. 1 railroad wrought scrap	16.00 to 16.25
Heavy steel axle turnings	12.50 to 12.75
Stove plate	10.25 to 10.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

Coke.—The heavy floods have put out of commission nearly all the blast furnaces in the Mahoning and Shenango valleys, and this means that a large tonnage of coke destined for these furnaces will be held up and part of it may have to be sold to other consumers. A furnace interest in the Wheeling district has bought 6000 tons of West Virginia for delivery over the remainder of the year. Sales have been made of 3000 to 4000 tons of prompt furnace coke at about \$2.40, which is top of the market. It is probable that prompt furnace coke could be bought to-day as low as \$2.25 at oven. A Cleveland furnace interest is in the market for 6000 tons per month, April to August. Sales of prompt furnace coke in the last few days have been light. We quote standard makes of furnace coke for delivery at \$2.30 to \$2.40 and on contracts over remainder of the year at about \$2.40 per net ton at oven. We quote best grades of 72-hour foundry coke for prompt delivery at \$3 to \$3.50 per net ton at oven. The Connellsville Courier gives the output of coke in the Upper and Lower Connellsville regions last week as 445,494 net tons, an increase over the previous week of 32,209 tons and the heaviest output in any one week in the history of the two regions.

Philadelphia

PHILADELPHIA, PA., March 25, 1913.

While pig-iron sales have not been large, the sentiment has materially improved. There is more inquiry and the belief gains ground that the market is on the verge of a buying movement. Prices of foundry grades show no further recession. Steel makers are in the market for basic iron, on which prices are still problematical. Eastern iron and steel mills are falling behind in promised deliveries, and specifications as well as new orders continue heavy, especially in plates, shapes and iron bars. Sheets are more active, and a good volume of business is moving in rolling and forging billets. Coke has been comparatively quiet. Old material is stronger, and the trade looks for an upward movement; very little came out at the recent low range of prices.

Iron Ore.—Furnaces take on occasional odd lots of domestic, but there has been little done in foreign ore. Importations during the week were confined to 4900 tons from Cuba.

Pig Iron.—Consumers of all grades are showing decidedly more interest in the market, although still following a waiting policy in connection with the placing of orders. On the other hand, producers, being encouraged by the steadily increasing inquiry, and anticipating an early buying movement, are inclined toward more firmness in prices, particularly in the foundry grades. While stocks on furnace yards in the East may be larger than they were several months ago, the tonnage is so small, compared with the consumptive rate, that it has no bearing on the situation, total stocks being still far below normal. One Delaware River cast-iron pipe maker has inquired for 3000 tons of low grade iron for delivery over the second quarter. Other pipe makers are taking on occasional small lots at prices running from \$16.25 to \$16.50, according to grade. A few inquiries for round lots of the higher grades of foundry iron are noted, although the bulk of the demand for No. 2X and No. 2 plain foundry continues in small lots. A malleable iron maker is in the market for 500

tons of coke malleable. For standard brands of eastern Pennsylvania No. 2X foundry, sales in lots ranging from carloads to 100 tons have been made at prices ranging from \$17.75 to \$18 delivered, for prompt or second quarter shipment. Virginia foundry irons have been quiet. Small lot business continues to be done at \$15.50 furnace, for No. 2X foundry, or \$18.30 to \$18.50 delivered in this vicinity, although this price is still out of line with eastern Pennsylvania irons. Resale Virginia foundry is being offered at slightly lower prices, but furnaces, in the absence of any important buying, have refrained from making concessions. A better movement in rolling mill forge iron has developed. One central Pennsylvania consumer has bought several thousand tons at prices close to \$17 delivered, although for delivery in this district \$16.75 can be done. Small sales have been more numerous. A large buyer who was temporarily in the market for 5000 tons almost immediately withdrew the inquiry. Several Schuylkill valley mills have been quietly looking around for forge iron, but have made no definite large inquiries. Consumers of basic pig iron are showing more interest in the situation. Two inquiries for second quarter basic, each for 3000 tons, are before the trade, while another large buyer is interested, but has made no inquiry. Prices of basic are still uncertain. For second quarter delivery \$17.50 may be considered the top of the market for standard analysis iron, although large buyers state that they would not like to offer \$17 if they were not ready to place business. Low phosphorus pig has been quiet, small sales being made at \$24.50 delivered here, for standard analysis iron. Quotations in some grades have a stronger appearance, due, not so much to sales, as to increased inquiry. In grades where the demand has been light weakness is still apparent. The following range of prices about represents the market for prompt or second quarter delivery in buyers' yards in this vicinity:

Eastern Pennsylvania No. 2 X foundry.....	\$17.75 to \$18.00
Eastern Pennsylvania No. 2 plain.....	17.50 to 17.75
Virginia No. 2 X foundry.....	18.30 to 18.50
Virginia No. 2 plain.....	18.05 to 18.25
Gray forge.....	16.75 to 17.00
Basic.....	17.50
Standard low phosphorus.....	24.50

Ferroalloys.—There has been no inquiry for forward ferromanganese and prices are nominally quoted at \$65, seaboard. More is being offered for prompt delivery and sales have been made in small lots at \$64 and \$65, seaboard, holders of surplus metal making concessions rather than put the material in store. Imports of ferromanganese at this port last week aggregated 875 tons. Small sales of 11 per cent. furnace ferrosilicon have been made at \$27.30 delivered here, although higher prices have been obtained for some grades.

Billets.—The demand for both rolling and forging steel continues active. The reported sale of 15,000 tons of rolling billets by an Eastern mill to the United States Steel Corporation last week was for delivery at its Pencoyd plant. Further sales of rolling billets in lots of 1000 tons have been made and some flexibility of prices has developed, grading as to the tonnage offered. Large lots have been done on a basis of \$30, delivered here, while small and moderate lots continue on a basis of \$32, delivered in this district. Forging billets are firm at \$36, mill, minimum, for ordinary analysis steel. Mills report an increasing hurry demand for shipment from customers for both rolling and forging steel.

Plates.—A satisfactory run of new business is coming out and mills find it more difficult, owing to the increasing specifications and heavy press for delivery, to meet promised delivery. The demand for all classes of plates has been good, although the bulk of the business has been for material entering into the construction of cars and for bridge work. Prices are strong. Eastern mills holding firmly at 1.75c. to 1.80c., delivered, although Western plates, for later delivery, are available at 1.65c., here.

Structural Material.—Mills are experiencing a heavy demand for miscellaneous lots of plain material, finding it difficult, notwithstanding premiums paid, to make satisfactory deliveries. In fabricated material bridge work continues large. Estimates are being made for a large apartment house, requiring some 1600 tons, while structural material aggregating 1000 tons is being figured on for a building in Baltimore. Several large buildings are in sight in this vicinity and the trade looks forward to a continued active demand. Prices are being firmly maintained. Eastern mills quoting from 1.75c. to 2c., delivered, for plain shapes, dependent on shipment. For extended delivery Western mills continue to quote 1.60c., here.

Sheets.—Buying, both on contract and in miscellaneous lots, has been good and Eastern mills are again finding it hard to make deliveries as promised. A comparatively large amount of business has been entered by Eastern makers for near future delivery. Prices are well maintained, Western makers quoting 1.90c. here for No. 10 blue annealed, while Eastern mills, making smooth loose-rolled sheets obtain 2c. for reasonably early deliveries.

Bars.—The demand for iron bars has shown some improvement. Mills are more comfortably situated as far as orders are concerned and prices are pretty firmly held at 1.60c., mill, or 1.67½c., delivered, for ordinary iron bars. For the better grades of bars 1.70c. to 1.77c., delivered here, is readily obtained. A large amount of business is pending in steel bars, heavy contracts for second half delivery from agricultural implement makers being still unclosed. Steel bars are strong at 1.55c. to 1.60c. for contract and 1.85c. for prompt delivery in this district.

Coke.—The market for both furnace and foundry coke has been quiet. Moderate sales of foundry coke have been made at prices ranging from \$2.75 to \$3.50 at oven. Furnace coke is a trifle firmer at \$2.25 to \$2.50 for prompt shipment. Less prompt furnace coke is in evidence. Quality has much to do in connection with the range of prices, which is comparatively wide. For delivery in buyers' yards in this vicinity, the following range of prices, per net ton, is named:

Connellsville furnace coke.....	\$4.25 to \$4.75
Connellsville foundry coke.....	4.90 to 5.65
Mountain furnace coke.....	4.15 to 4.65
Mountain foundry coke.....	4.60 to 5.10

Old Material.—Buying continues along narrow lines, but sentiment is better and a feeling that more remunerative prices will shortly prevail is general. Sellers refuse to dispose of material at the present low levels and in several instances buyers have paid higher prices. Dealers readily pay \$13.75 for No. 1 heavy melting steel, although mills have bought small tonnages at \$13.50. Few holders will sell No. 1 steel under \$14, delivered, as lower prices would divert to the West steel from New England, New York and other Eastern sources of supply. No. 1 railroad wrought has been sold at better prices, running up to \$16.25, delivered, for small lots. Turnings have been sold at \$10.75, delivered. Borings have also been in better demand. Quotations, while still largely nominal, range about as follows, for small lots, delivered in buyers' yards in this district, covering eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel.....	\$13.50 to \$14.00
Old steel rails, rerolling (nominal).....	15.50 to 16.00
Low-phosphorus heavy melting steel scrap.....	17.75 to 18.00
Old steel axles (nominal).....	19.00 to 20.00
Old iron axles (nominal).....	27.00 to 28.00
Old iron rails.....	28.00 to 28.50
Old carwheels.....	15.00 to 15.25
No. 1 railroad wrought.....	16.00 to 16.50
Wrought-iron pipe.....	13.00 to 13.50
No. 1 forge fire.....	12.00 to 12.50
No. 2 light iron (nominal).....	7.00 to 7.50
No. 2 cut busheling.....	10.00 to 10.25
Wrought turnings.....	10.50 to 11.00
Cast Borings.....	10.25 to 10.75
Machinery cast.....	14.00 to 14.50
Grate bars, railroad.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Railroad malleable (nominal).....	13.00 to 13.50

Cincinnati

CINCINNATI, OHIO, March 26, 1913.—(By Telegraph.)

Pig Iron.—Buyers are showing no disposition to come in the market for future requirements, and as a rule the furnace interests are content to await developments. However, resale iron from both the South and the Hanging Rock district is being offered below the market but only for immediate shipment. The tonnage under actual negotiation is not sufficiently large to warrant a change in quotations, although these offerings have naturally had a tendency to soften prompt shipment quotations, as well as to further postpone buying for future delivery. Southern No. 2 furnace iron is readily available at \$13, Birmingham basis, for the second quarter, with several furnaces asking more. The recognized quotation on Southern Ohio No. 2 foundry is now \$16, Ironton, and it is conceded that a few producers are willing to take on last-half business at the same figure. Shipments on contracts are going forward at a satisfactory rate and it is stated that no iron is being piled in the Ironton district, although there has been a slight increase in stocks in the South. The only inquiries worthy of mention are one for 1000

tons each of Northern and Southern foundry iron, and another for 2000 tons of malleable, both from Central Western melters and for last-half shipment. Branch offices in St. Louis report some activity in basic and malleable. Basic iron in this territory is somewhat firmer than foundry, and some heavy buying of basic is expected to develop at an early date. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft.	\$16.75 to \$17.25
Southern coke, No. 2 foundry and 2 soft.	16.25 to 16.75
Southern coke, No. 3 foundry	16.00 to 16.25
Southern, No. 4 foundry	15.75 to 16.00
Southern gray forge	15.50 to 15.75
Ohio silvery, 8 per cent. silicon	20.70 to 21.20
Southern Ohio coke, No. 1	17.70 to 18.20
Southern Ohio coke, No. 2	17.20 to 17.70
Southern Ohio coke, No. 3	16.95 to 17.20
Southern Ohio malleable Bessemer	17.20 to 17.45
Basic, Northern	17.70 to 18.20
Lake Superior charcoal	19.25 to 19.75
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—The demand for foundry coke has improved. Prices quoted by the oven operators are also firmer, and while we continue our market quotations of \$3 to \$3.50 per net ton at oven for Connellsville 72-hr. coke, a few leading producers are holding out for \$3.75. In the Wise County and Pocahontas fields the foundry coke position is also a trifle stronger, with prices averaging about the same as in the Connellsville district. Furnace coke is sluggish, but as a number of furnaces will have to come into the market soon for their last-half supply, an improvement may be noted before the month is over. We quote standard 48-hr. coke at \$2.50 per net ton at oven in all three districts, with a possible variation of about 10c. a ton either way on different brands. All of the above quotations cover both spot and contract business.

Finished Material.—From a number of sources a better inquiry is reported, especially for structural shapes and reinforcing concrete bars. There is no falling off in the call for galvanized sheets. Prompt delivery can only be made by the mills on odd lots of different kinds of finished material, and jobbers who have stocks on hand are still able to obtain a premium over regular market prices. We quote mill prices as follows: Steel bars, 1.40c. to 1.45c., and structural shapes, 1.55c. to 1.60c., Pittsburgh basis. There is an improvement in the demand for railroad track material.

Old Material.—It is stated that for the first time in the history of the trade here steel turnings are quoted at the same figure as cast borings. Heavy offerings, with a comparatively light demand, probably brought about this condition. With the exception of burnt scrap, all other grades are stationary. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum prices are dealers' quotations f.o.b. at yards:

Per Gross Ton.	
Bundled sheet scrap	\$10.25 to \$10.75
Old iron rails	13.75 to 14.25
Relaying rails, 50 lb. and up.	20.75 to 21.25
Re-rolling steel rails	12.75 to 13.25
Melting steel rails	10.75 to 11.25
Old carwheels	12.50 to 13.00
Per Net Ton.	
No. 1 railroad wrought	\$10.75 to \$11.25
Cast borings	6.50 to 7.00
Steel turnings	6.50 to 7.00
No. 1 cast scrap	10.50 to 11.00
Burnt scrap	7.75 to 8.25
Old iron axles	18.00 to 18.50
Locomotive tires (smooth inside)	11.75 to 12.25
Pipes and flues	7.25 to 7.75
Malleable and steel scrap	9.00 to 9.50
Railroad tank and sheet scrap	6.00 to 6.50

Birmingham

BIRMINGHAM, ALA., March 24, 1913.

While furnace companies have made an effort to maintain the \$13.50 schedule, it is understood that agents have been authorized to quote 25 cents under that figure in order to determine if that would bring business. Reports are that as little iron was sold as on the \$13.50 basis the preceding week. Resale iron does not longer figure prominently in price making for the reason that each transaction is based upon the attitude of the seller irrespective of others rather than upon general market conditions. This iron has been sold under \$13 and can perhaps be secured still around \$12.75, but in many instances it is not especially desirable. In spite of the weakness in prices the Tennessee company has blown in Oxmoor furnace, but as that company is manufacturing much more basic than foundry iron and is using the basic in its steel mills, the increase in its

production is not significant. Carload lots have been disposed of at from \$13.25 to \$14, with the most volume of business at the former figure. It is still a hand-to-mouth proposition, with the furnaces preferring to sell into second half as little as possible at the present prices. Foundry iron consumption has been curtailed in some quarters by high water. The general pig-iron situation is about the same, with a more pronounced tendency on the part of the furnaces to accept \$13.25. Prices f.o.b. cars Birmingham are as follows:

No. 1 foundry and soft	\$13.50 to \$14.00
No. 2 foundry and soft	13.00 to 13.50
No. 3 foundry	12.50 to 13.00
No. 4 foundry	12.25 to 12.75
Gray forge	12.00 to 12.50
Basic	13.00 to 13.50
Charcoal	25.00 to 25.50

Cast-Iron Pipe.—The water-pipe trade is no more satisfactory than it has been for several weeks, although a more open acknowledgment of the situation is apparent. Stocks have accumulated at several plants and the concession heretofore referred to is now obtainable elsewhere. Recent orders are principally for repairs. Prices are \$23.50 for 4 in. and \$21.50 for 6 in. and upward.

Coal and Coke.—Coal production has been considerably hampered by high water and consumers have been insistent on deliveries. Prices remain about the same. Coke continues strong at the prices prevailing in the past few weeks, namely, \$3.50 to \$4.25, according to the quality.

Old Material.—Old material has not moved in the same quantities as a week ago owing to a depletion of the yards when price concessions were first offered. No one is stocking heavily. Wrought and machinery cast are in good demand and relaying rails are sold promptly whenever secured by dealers. Quotations f.o.b. cars at dealers' yards in Birmingham are as follows:

Old iron axles	\$15.50 to \$16.00
Old steel axles	15.50 to 16.00
Old iron rails	14.00 to 14.50
No. 1 railroad wrought	12.50 to 13.50
No. 2 railroad wrought	10.50 to 11.50
No. 1 country wrought	10.00 to 10.50
No. 2 country wrought	9.00 to 9.50
No. 1 machinery cast	10.50 to 11.00
No. 1 steel scrap	11.00 to 11.50
Tram carwheels	11.00 to 11.50
Standard carwheels	12.50 to 13.00
Light cast and stove plates	9.00 to 9.50

German Pig Production Increases

Steel Bars Lower, New Buying Restricted, but Specifications on Orders Brisk

BERLIN, March 13, 1913.

The February figures of pig-iron production given out at the end of last week showed that the daily rate of production had increased 1378 tons. The month's make was 1,492,511 metric tons. This was 117,000 tons less than for January, which was three days longer, but it was 155,000 tons more than for February, 1912.

This activity of production, however, is about the brightest spot in the situation. Consumers, it is reported in a dispatch from Düsseldorf, are holding off, and steel bar prices have further dropped to 118 to 120 marks, against 122 to 125 marks February 27, and even this reduction has failed to bring out buyers. It is added that the export price for bars has also receded to 115 marks, yet, according to this dispatch, specifications on old bar orders continue to come in briskly.

It is everywhere admitted that the remarkable tension in the money market and the prolonged political unrest of Europe are restricting fresh buying to the narrowest possible limits consistent with the requirements of consumers. But a better feeling regarding the political outlook is now manifest, the whole trade placing strong hopes upon the settlement of the war and other problems in southeastern Europe. That there is a prospect of continued activity at furnace plants is indicated by the fact that ore imports in February reached 1,010,000 tons, as compared with 801,000 tons in February, 1912. The shipments of the Steel Works Union in February also kept up well, having amounted to about 506,000 tons, as against 535,600 tons in January. The daily shipments averaged about 460 tons higher than in January. Shipments of steel rails were only slightly less than in January, nor was the difference great in structural shapes.

The exports of pig iron in February reached 75,979 tons, against 88,023 last year; semi-finished steel, 61,886 tons, against 61,215 tons; beams and other structural shapes, 39,617 tons, against 29,172 tons; steel rails, 41,494

tons, against 38,543 tons; and steel ties, 8766 tons, against 13,369 tons.

According to a Cologne dispatch a further meeting of the tube manufacturers was held today, but an agreement was not reached. Meanwhile efforts are continued toward making the existing tube convention more effective.

A further meeting of the Rod Association will be held tomorrow; but it is not expected that an agreement will result from it. It is admitted that all the hard work hitherto done for the prolongation and expansion of the association so as to include wire and wire nails has accomplished practically nothing.

The declining tendency in the Belgian market has made further progress. At the end of last week a cut of 2.50 francs on both basic and iron sheets for the home trade was reported. It is expected, however, that prices for the home trade at least will now become steadier, the danger of a general strike having been averted. Some of the trade reviews finding their way into the German press from Belgium even claim that the position of the iron trade has grown better.

The great Gelsenkirchen Company, which ranks with Krupp's in capital and in importance, has published its annual report, showing gross profits of 58,077,000 marks, which compares with 45,972,000 marks for 1911. The amount distributed in dividends is 18,000,000 marks, against 14,560,000 marks in 1911. Ten per cent. is paid on the entire capital, whereas for 1911 10 per cent. was paid on the old capital, but only 6 per cent. on an issue of newer stock.

British Tin Plate Trade Demoralized

More Welsh Mills Closing Down

—A Check to Pig-Iron Buying

(By Cable)

MIDDLESBROUGH, ENGLAND, March 26, 1913.

The tin plate trade remains demoralized. Financial difficulties are developing and more mills are closing. The Cleveland pig-iron "squeeze" in warrants continues and checks fresh buying. Stocks of warrant iron are 215,066 tons, against 216,580 tons one week ago. We quote as follows:

Cleveland pig-iron warrants (closing Tuesday), 64s. 10½d., against 64s. 8 d. one week ago.

No. 3 Cleveland pig-iron makers' price, f.o.b. Middlesbrough, 65s. 3d., the same as one week ago.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £5 7s. 6d.

German sheet bars, f.o.b. Antwerp, 112s. 6d.

German 2-in. billets, f.o.b. Antwerp, 107s. 6d.

German basic steel bars, f.o.b. Antwerp, £5 16s.

Steel bars, export, f.o.b. Clyde, £8.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7 7s. 6d.

German joists, f.o.b. Antwerp, £5 12s. to £5 15s.

Steel ship plates, Scotch, delivered local yards, £8 7s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £0 15s.

Steel rails export, f.o.b. works port, £6 15s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb. f.o.b. Wales, 14s. against 13s. 10½d. last week.

(By Mail)

Uncertainty in Pig Iron—Tin Plate Outlook

Not Improved and Stocks Are Very Large

MIDDLESBROUGH, March 14, 1913.

The pig-iron market has been all agog to know what is likely to happen in Cleveland iron. So far the developments have been tame. Since the drop of 10s. from the top, the price has up to the time of writing improved 3s. to 4s., but it looks as if the task of lifting it to its recent top notch would prove a hopeless one. The shipments of pig iron from the Tees in February were 92,800 tons, being the same quantity as in January, and the total for the first two months of the year was 185,000 tons, against 193,000 tons in 1912 and 172,000 tons in 1911. March is usually reckoned a good month. Last year it was the banner month, with 133,000 tons, and we are now running close to the time when the spring demand will have to be satisfied. The extent of this must have a very close bearing upon the general situation. Meanwhile the British pig-iron market is mainly held back by dear money, European politics, poor Wall street news, and the contradictory and bewildering nature of the trade advices cabled to this side from New

York. Undoubtedly the Balkan trouble weighs heavily on the industrial world of Europe, for it is the almost universal impression that with the conclusion of peace between Turkey and the Balkan States, the real struggle will loom in sight.

The tin plate trade is in the slough of despond, and prices are well below prime costs, although in this connection it must not be forgotten that steel and tin have also come down, which will tend to ease the position of makers in regard to forward business. A bitter feeling exists among the Welsh makers, who, unable to agree on a concerted shut-down, resented the way in which leading works after the conclusion of the negotiations commenced to slash prices. These people sold 20 x 14 common cokes down to 13s. 10½d. f.o.b. Wales, and there were other needy sellers who accepted 13s. 9d., but from that level there was a recovery of small amount. The trouble cannot be regarded as over until the heavy stocks in Wales are to a large extent distributed. Conservative estimates put the total quantity held by works and in the Swansea warehouses, at 1,000,000 boxes, while less guarded estimates regard 1,500,000 boxes as being nearer the mark. Anyhow the congestion of plates on the railroads and at Swansea has been appalling, and in vain endeavor to clear up the tangle the railroad companies serving the district recently issued a notice to the tin plate manufacturers shipping from Swansea, that they would only accept traffic for conveyance if the vessel were actually in port. No traffic other than for direct shipment would, it was said, be accepted. As a result, however, of a deputation from the Welsh Tin Plate Manufacturers' Association and the Swansea Harbor Trust the order was withdrawn. Had it been enforced it would certainly have involved very awkward complications in connection with trade custom as regards the export markets. As already cabled you, the Standard Oil Company took 50,000 boxes of oil sizes at 14s. 6d. basis for quarters for shipment to the East.

There is no change in finished steel products but semi-finished is decidedly easing down. The Germans and Belgians cannot sell here now, for local prices are the cheapest, and it remains to be seen what their policy will be when it comes to a tussle for business. The Americans are not anxious to sell, but the Steel Corporation will quote to old customers for the sake of holding their trade.

Buffalo

BUFFALO, N. Y., March 25, 1913.

Pig Iron.—The market continues dull with very little inquiry and light sales. Interest on the part of purchasers does not appear to have broadened and orders are still persistently withheld. The present period of slack buying which has continued with almost no intermission since December last is about the longest which producing interests here have record of. There has been no quotable change in price schedules since last week's report. It is a buyers' market and each deal that comes up is considered on its own merits by such furnaces as have iron of the required analysis and obtainable for the desired date of delivery. We quote the approximate market as below, f.o.b. Buffalo, for delivery over the remainder of the year:

No. 1 foundry	\$16.75 to \$17.00
No. 2 X foundry	16.50 to 17.00
No. 2 plain	16.25 to 16.75
No. 3 foundry	16.25 to 16.50
Gray forge	16.00 to 16.25
Malleable	17.00 to 17.25
Basic	17.50 to 18.00
Charcoal, regular brand and analysis.....	18.00 to 19.00
Charcoal, special brand and analysis.....	21.75

Finished Iron and Steel.—Specification against contracts continues to be exceedingly good, the daily average so far this month running a little ahead of the average for February, demonstrating that the volume of business and the demand in this district is not diminishing. The demand for railway material, spikes, track bolts, nuts, rivets, etc., is brisk at firm prices and business in black and galvanized sheets continues active with evidences of a hardening tendency in prices. Output is somewhat restricted owing to the scarcity of sheet bars. Announcement is made of an advance of \$1 per ton in wire products, making nails \$1.80 and plain wire \$1.60, Pittsburgh base, for carload lots and the usual differential for less than carloads. It is understood that producers are advising contract customers that unless contracts placed at former prices are specified in full prior to April 1 for delivery in April, the unspecified balances will be cancelled. The International Railway Company, this city, has placed 2000 tons

of 85-lb. rails with the Lackawanna Steel Company and 4500 tons of 124-lb. girder rails with Lorain mills. Business in fabricated structural lines is exceptionally good. Bids are in for 240 tons for a store and loft building for the Buffalo Maintenance Company and figures are soon to be asked for 200 tons for a club house for the Order of the Orioles, Buffalo, in the middle of April for 500 tons for a seven-story 170 x 200 ft. store and loft building for the G. H. Poppenberg Company, Buffalo. The C. F. Ernst's Sons Iron Works, Buffalo, was low bidder for 100 tons for the public school at Sloan, N. Y. The act creating the Buffalo Terminal Commission has been approved and the Lackawanna Railroad Company is now in position to proceed with the construction of its new passenger station at the foot of Main street, requiring with the elevated track approximately 1500 tons of structural steel.

Old Material.—The market is quiet with a slightly weaker tendency in prices for some lines, particularly old carwheels, the demand for which has eased off. A slight improvement is noted in inquiry for old steel axles, owing undoubtedly to the scarcity of semi-finished steel material and the price has stiffened correspondingly. Consumers are taking a fair amount of material on contracts and dealers are expecting a better situation as regards new placement. We quote dealers' prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$14.00 to \$14.75
Boiler plate, sheared	15.50 to 16.00
No. 1 busheling scrap	11.50 to 12.00
No. 2 busheling scrap	9.50 to 10.00
Low phosphorus steel	17.00 to 17.50
Old iron rails	15.00 to 15.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	17.50 to 18.00
Old iron axles	24.00 to 24.50
Old carwheels	15.50 to 16.00
Railroad malleable	13.25 to 13.75
Locomotive grate bars	11.00 to 11.50
Stove plate (net ton)	9.75 to 10.00
Wrought pipe	10.00 to 10.50
Wrought-iron and soft steel turnings	7.75 to 8.25
Clean cast borings	7.50 to 8.00
Bundled tin scrap	18.00

Boston

BOSTON, MASS., March 25, 1913.

Old Material.—The market has changed little since last week. The mills have not yet begun to buy in any volume. Material is coming out in fair quantities for the season. Prices have not altered. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$11.50 to \$11.75
Low phosphorus steel	13.50 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles	22.50 to 23.00
Mixed shafting	13.50 to 13.75
No. 1 wrought and soft steel	10.75 to 11.00
Skeleton (bundled)	9.00 to 9.50
Wrought-iron pipe	10.00 to 10.25
Cotton ties (bundled)	9.50 to 9.75
No. 2 light	4.00 to 4.50
Wrought turnings	7.50 to 7.75
Cast borings	7.50 to 7.75
Machinery, cast	13.50 to 14.00
Malleable	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	7.50 to 7.75
Cast-iron carwheels	15.00 to 15.50

New York

NEW YORK, March 26, 1913.

Pig-iron.—A 4000-ton inquiry has come from a Connecticut manufacturing company, the iron called for being of different grades, chiefly No. 2 X. It is expected this business will be closed within a day or two. Deliveries are wanted within 30 days, and if water delivery is made the iron will be taken at once. An Eastern railroad has bought 500 tons of iron for its foundry in the Lebanon Valley and there is an inquiry for 1000 tons of charcoal iron. Apart from what has just been mentioned there are no large inquiries before the Eastern trade and the sales made have been otherwise for small lots for comparatively early delivery. Strikes at three foundries in the Newark district, one of them having a large daily melt, have held up shipments but otherwise iron is going from furnaces according to contract. The average buyer has iron to run him through the second quarter and is not con-

cerned about his ability to get current prices when he is ready to come into the market, though it is not overlooked that if several important buyers should come forward with good-sized tonnages the present weak conditions might change pretty promptly. We quote as follows for Northern iron at tidewater: No. 1 foundry, \$17.75 to \$18.25; No. 2 X, \$17.50 to \$17.75; No. 2 plain, \$17.25 to \$17.50. Southern iron is quoted at \$17.75 to \$18.25 for No. 1 foundry and \$17.50 to \$17.75 for No. 2.

Structural Material.—Great confidence in the outlook up to the fourth quarter; a slight betterment in the total volume of new business placed, indicating the opening of spring building operations, but no new projects of large size, describe the present situation. The practical absence of speculative buying is regarded as minimizing cancellation with the development of untoward events, and this is the foundation, in part, for the belief that things are satisfactory until the last quarter. It is believed that much beyond depends on the attitude of the present Federal Government and on the crop reports. Plain shapes are obtainable on an average of six weeks and in some sizes four weeks, and even two or three weeks is sometimes possible, but all at 1.60c., Pittsburgh. The price of 1.86c., New York, has practically disappeared. A recent addition to the engineering force of the Chesapeake & Ohio lends color to the rumors that considerable bridge work is in prospect for that railroad. The requirements for the building for the Hill Publishing Company, New York, are larger than first estimated, or about 3500 tons. Quotations for plain material are 1.61c. to 1.66c., New York, for mill shipments in the third and fourth quarters; 1.76c., New York, for delivery in four to eight weeks, and for lots from store, 2.15c., New York.

Plates.—Deliveries from Eastern mills are still three to four weeks and the price remains unchanged, or 1.60c., Pittsburgh. In fact, these mills are hesitating to close for large business at 1.60c. for third quarter. There are no new inquiries for cars, but orders for about 1300 have been placed, including 100 flat cars with the American Car & Foundry Company, and 450 box cars with the Standard Steel Car Company for the Havana Central; 300 box cars and 6 caboose, with the Mt. Vernon Car Mfg. Company, and 160 flat cars, also closed, for the Norfolk & Southern; 100 dump cars with the Pressed Steel Car Company for the Southern Pacific, and the following passenger equipment for the Pennsylvania Lines West: Pressed Steel Car Company, 25 coach; Standard Steel Car Company, 10 coach and 5 dining cars; American Car & Foundry Company, 7 coach, 31 passenger and baggage, 5 baggage and 2 mail cars. Quotations remain 1.61c. to 1.66c., New York, for mill shipments in the fourth quarter, and 1.76c. for shipments in 3 to 4 weeks, with \$1 a ton additional for universal plates.

Bars.—Additional reports have been received of the closing with agricultural implement manufacturers of a round tonnage at 1.40c., Pittsburgh, for the year beginning July 1, but this indication of a belief in the continued strength of the market is in opposition to the attitude of a number of large buyers in this district, who formerly expressing the desire to close for fourth quarter, declined the offers lately when the seller decided to entertain the business. Specifications against contracts have in some quarters at least shown a falling off, but steel mills are still suffering from the scarcity of the semi-finished steel and for some lines consumers are as insistent as ever for deliveries. Shafting is also weak, a discount as high as 60 per cent. being given for less than carload lots, when 53 per cent. is regarded as the market. No change is noted in bar iron and generally the mills are not sold far ahead and capacity is easily equal to demand. Softness is still noted in bar-iron products. Steel bars are quoted at 1.56c., New York, for future delivery, three and more months hence, while refined iron bars are still held at 1.65c. to 1.80c., New York, with considerable business at the lower levels. Store prices for steel bars are 2.05c. and for iron bars 2.10c.

Cast-Iron Pipe.—Brockton, Mass., will open bids on 300 tons March 28. The city of New York will open bids from contractors April 9 on an extension of the high pressure fire protection system which will require 9000 tons. These are the only public lettings of moment in this territory in the immediate future. The demand from private buyers keeps up well, inquiries coming forward in satisfactory number. Prices of carload lots of 6 in. range from \$23.50 to \$25 per net ton, tidewater.

Ferroalloys.—Inquiries for 80 per cent. ferromanganese involve a few carloads of spot only. Sellers

of resale material have been taking most of the going business at a price below \$64, Baltimore, and probably near \$63. At the same time there has been a little selling at \$65, Baltimore, and should a large quantity be wanted it could be had only at the full price. Ferrosilicon, 50 per cent., is quiet and unchanged at \$75, Pittsburgh, for carloads, \$74 for 100 tons and \$73 for 600 tons and over.

Old Material.—Dealers report a moderate volume of routine business. Inquiries from steel works and rolling mills are light, consumers showing no disposition to anticipate their immediate requirements. Foundries are taking only small lots of cast scrap. Despite the moderate demand, prices seem to be somewhat stronger. Dealers' quotations are as follows, per gross ton, New York City and vicinity:

Old girder and T rails for melting.....	\$11.00 to \$11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	22.00 to 22.50
Rerolling rails (nominal)	14.00 to 14.50
Iron car axles	24.00 to 24.50
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	13.75 to 14.25
Wrought-iron track scrap	12.25 to 12.75
No. 1 yard wrought, long	12.00 to 12.50
Light iron (nominal)	4.50 to 5.00
Cast borings	8.00 to 8.50
Wrought turnings	8.25 to 8.75
Wrought pipe	10.75 to 11.25
Old carwheels	14.50 to 15.00
No. 1 heavy cast, broken up.....	11.25 to 11.75
Stove plate	8.75 to 9.25
Locomotive grate bars	8.00 to 8.50
Malleable cast	11.00 to 11.50

Chicago

CHICAGO, ILL., March 26, 1913.—(By Telegraph.)

Without the background of mill order books filled for several months to come, current developments in iron and steel in this territory would appear only moderately encouraging. The effects of the gradually reduced buying pressure are becoming more apparent, as with most of the mills the pendulum has begun to swing back toward easier delivery conditions. Applied to the mills booked farthest into the future, this adjustment is not so significant, but with improved deliveries the more common premiums are disappearing, and those that have been catering to premium business are now seeking orders at closer to regular prices. This situation applies to sheets and plates especially. Additional implement bar tonnage has not been placed, but the real buying in this is in the future. New rail tonnage offerings include several small lots for particular extension work. The finished lines in which there is the greatest activity are the lighter structural shapes and bars required for spring building purposes, and this activity is especially reflected in the demand on jobbers' stocks. Notices of an advance of \$1 a ton in the price of wire products have been issued. There are no significant changes in either the pig-iron or old material situation.

Pig Iron.—Malleable iron foundries are figuring with the agricultural interests on their annual contracts for malleable castings, and in this connection, inquiries for pig iron, largely with a view to ascertaining prices, are numerous. Actual buying continues limited. Some sales of local iron on the basis of \$17.50 f.o.b. furnace ton No. 2 are reported. If concessions from this ruling price are made, they are without special significance, in view of the light buying. Southern iron is no stronger. Spot iron in this market is moving at prices ranging from \$13.25 to \$13.75, Birmingham, the price depending upon the relative eagerness of the buyer and seller to close the transaction. One of the Birmingham furnaces which has been making the low prices in this market is understood to have sold up its capacity for the first half. There is practically no demand for iron from the South for future delivery. The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4.....	\$18.00 to \$18.75
Northern coke foundry, No. 1.....	17.50 to 18.00
Northern coke foundry, No. 2.....	17.25 to 17.50
Northern coke foundry, No. 3.....	16.75 to 17.25
Southern coke, No. 1 foundry and No. 1 soft	18.35 to 18.85
Southern coke, No. 2 foundry and No. 2 soft	17.60 to 18.35
Southern coke, No. 3	17.10 to 17.60
Southern coke, No. 4	16.85 to 17.10
Southern gray forge	16.85 to 17.35
Southern mottled	16.35
Malleable Bessemer	17.25 to 17.75
Standard Bessemer	19.40 to 19.90
Basic	17.25 to 17.75
Jackson Co. and Kentucky silvery, 6 per cent.....	20.40
Jackson Co. and Kentucky silvery, 8 per cent.....	21.40
Jackson Co. and Kentucky silvery, 10 per cent.....	22.40

Market Reports Missing

Up to the hour of going to press our usual market reports from Cleveland, Chicago and St. Louis, which are transmitted by mail, have not come to hand. The heavy storms in the West, which have so interfered with railroad operations, are evidently responsible for this interruption in our service.

Metal Market

NEW YORK, March 26, 1913.

The Week's Prices

Copper, New York.		Cents Per Pound for Early Delivery.		Lead		Spelter	
Mar.	Lake.	Electro-lytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
20.....	15.00	14.87½	46.15	4.35	4.20	6.25	6.10
21.....	15.00	14.87½	46.20	4.35	4.20	6.25	6.10
22.....	15.00	14.87½	46.20	4.35	4.20	6.25	6.10
24.....	15.00	14.87½	46.20	4.35	4.20	6.25	6.10
25.....	15.00	14.87½	46.45	4.35	4.20	6.20	6.05
26.....	15.00	14.87½	46.75	4.35	4.20	6.20	6.05

Copper is quiet and without change. Tin is higher, but inactive. Lead is unchanged. Spelter is lower. Antimony continues dull.

New York

Copper.—The market has been inactive, except for occasional orders. The lack of business has caused a somewhat softer tone, but this promises to disappear with the news from abroad this morning that Adrianople has fallen. The news caused an advance of 17s. 6d. in the price of copper in London and the strength abroad probably will be reflected here. Some producers of Lake are holding their price well above 15c., but are doing no business, while a few electrolytic companies are asking higher than 14.87½c. but likewise are getting no business. Other selling agencies have been willing to shade 14.87½c. so that 15c., cash New York, for Lake, and 14.87½c., cash New York, for electrolytic, are accepted as a fair market level. No great amount of business is expected until after the issuance of the Copper Producers' statement for March. The best feature of the situation is the heavy exports which total 34,116 tons for the month, although very few believe that all of the copper going abroad is for immediate consumption. The price in London to-day is £65 7s. 6d. for spot and £65 15s. for futures.

Pig Tin.—This metal has been very quiet until yesterday when quantities estimated to total 200 tons, for delivery up to July, changed hands at fairly full prices as a result of transactions which had every appearance of being caused by the need of covering short contracts. Prior to this bit of activity the market had been quieter than for many days. Spot tin advanced 1s in London on the strength of the news concerning Adrianople in view of the fact that the capture of the Turkish city is expected to mean quick progress toward a clearing up of the Balkan situation. The trade is inclined to be more optimistic and the belief is held that prices have gone as low as they will for the present and that improvement in conditions is due. Tin continues to sell below the import cost. As an example, the metal sold in New York yesterday at 46.45c., while the import cost was 46.65c. The arrivals have been unusually large, amounting to 5,575 tons for the month. Deliveries are expected to be correspondingly good. The New York price to-day is 46.75c. and in London £213 is the quotation for spot and £210 for futures. There is afloat 2180 tons.

Lead.—Extreme dullness continues to characterize the market which is considered a trifle softer by reason of the large offerings and small demand. Anticipation of tariff changes is making final consumers go slow. The New York price is unchanged at 4.35c. and that of St. Louis, 4.20c.

Spelter.—Since the recent flurry of buying this metal has sagged in price until 7.20c., New York, and 6.05c., St. Louis, are quoted for March delivery with April and May five to ten points lower. The market is extremely quiet, so much so that production of ore has been cut down according to reports in the West.

Old Metals.—Dealers report a fair demand, with selling prices unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	14.25 to 14.50
Copper, heavy and wire	13.75 to 14.00
Copper, light and bottoms.....	12.75 to 13.00
Brass, heavy	9.25 to 9.50
Brass, light	7.75 to 8.00
Heavy machine composition	12.75 to 13.00
Clean brass turnings	8.50 to 8.75
Composition turnings	11.00 to 12.00
Lead, heavy	4.00
Lead, tea	3.75
Zinc, scrap	5.25

Antimony.—The overstocked condition of consumers and probably some dealers continues to exercise a deterrent effect on business and predictions are that relief will not be at hand for some time to come. Cookson's is quoted at 9c., Hallett's at 8.50c. and Chinese and Hungarian grades at 7.62½c. to 7.75c.

Iron and Industrial Stocks

NEW YORK, March 26, 1913.

The stock market was heavy for the greater part of the past week. The failure of the Union Pacific-Southern Pacific segregation project had an adverse influence on railroad shares, while a heavy decline in Rumely common had a sympathetic effect on other industrial issues. Rumely common sold down to 42½ on Monday of this week, which is a loss of 55½ from the record high point of 101 made November 14, 1912. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Am. Can. com.....	27½-31½	Pressed Steel, pref.....	97
Am. Can. pref.....	118½-121½	Railway Spring, com. 27½-	32½
Am. Car. & Fdy., com. 48-	50	Railway Spring, pref.....	98
Am. Loco., com.....	34½-35¾	Republic, com.....	24-25¼
Am. Steel Foundries 32-	33	Republic, pref.....	83¾-84¾
Bald. Loco., com.....	46½-47½	Rumley Co., com.....	42½-55½
Bald. Loco., pref.....	103½-104	Rumely Co., pref.....	84¾-87
Beth. Steel, com.....	33-35½	Sloss, com.....	33-36½
Beth. Steel, pref.....	68-70¾	Pipe, com.....	13½
Case (I. I.), pref.....	99¼-100¼	Pipe, pref.....	52
Colorado Fuel.....	31-34	U. S. Steel, com.....	58½-61½
Deere & Co., pref.....	98	U. S. Steel, pref.....	107-107¾
Emer-Brant, com.....	44½-48	Westinghouse Elec., 60½-	65¼
General Electric.....	135¼-138¾	Am. Ship, com.....	50
Gr. N. Ore. Cert.....	33¾-34¾	Am. Ship, pref.....	101
Int. Harvester, com.....	106	Chic. Pneu. Tool.....	48½-49½
Int. Harvester, new.....	106	Cambria Steel.....	49¾-50¾
Int. Harvester Corp.....	105¾	Lake Sup. Corp.....	27½
Int. Pump, com.....	8½-10¾	Warwick.....	10½
Int. Pump, pref.....	38	Crucible Steel, com. 15-	15¼
Lackawanna Steel.....	44-44½	Crucible Steel, pref.....	91-94
Nat. En. & St., com. 13¾-	14	Harb. Wk. Ref., com.....	48
Nat. En. & St., pref. 84-	86	Harb. Wk. Ref., pref.....	104¼
Pressed Steel, com.....	24¾-26		

Dividends Declared

The Washburn Wire Company, regularly quarterly, 1¾ per cent. on the preferred stock, and initial dividend, 1½ per cent., on the common stock, payable April 18.

The E. W. Bliss Company, regular quarterly, 2 per cent. on the preferred stock, payable April 1.

The Crucible Steel Company of America, regular quarterly, 1¾ per cent. on the preferred stock, payable March 31.

The Railway Steel Spring Company, 2 per cent. on the common stock, payable May 20, out of the surplus of 1912. This is the first common dividend paid by the company since 1908.

The General Fire Proofing Company, regular quarterly, 1¾ per cent., payable April 1.

The American Shipbuilding Company, regular quarterly, 1¾ per cent. on the preferred stock, payable April 15.

The Sharon Steel Hoop Company, regular quarterly, 1¾ per cent., payable March 31.

A table of the calorific value of different coals and another table to assist in a quick determination of the evaporation of one's boiler plant have been issued by the Illinois Stoker Company, manufacturer of chain grate stokers and coal and ash-handling machinery, Alton, Ill. The table, covering the designation and origin of fuels, gives the location of the coal bed, its proximate analysis, its calorific value, etc. Knowing the source of the fuel and the average efficiency of the boiler plant, the second table gives immediately the evaporation of the boiler plant in terms of the coal burned.

The United Steel Company, Canton, Ohio, is contracting for the erection of large additions to its plant and the installation of two 75-ton open-hearth furnaces, charging machines, cranes, gas producers, soaking pits and other equipment to handle the product of these furnaces. To provide room for the extensions the company has purchased 40 acres adjoining its present plant. It is installing a Deane triplex power pump, electrically driven and controlled, and a Worthington centrifugal general service pump.

The Cleveland Engineering Society, Cleveland, Ohio, will make a trip of inspection April 1 to the plants of the Standard Tool Company and the Warner & Swasey Company.

Iron and Steel Works Closed by Floods

References are made in our market reports to flood damage in the Central West, particularly in Ohio, and to the shutting down of steel works and rolling mills. In the Shenango Valley, blast furnaces, steel works and finishing mills at Sharon and New Castle have been shut down by the overflowing of the Shenango River. At Youngstown the works of the Republic Iron & Steel Company and the Youngstown Sheet & Tube Company were flooded and blast furnaces were banked. The Niles furnace of the Carnegie Steel Company was stopped by the Mahoning River flood, and at the Ohio works of the company at Youngstown, the steel plant and rolling mills were interrupted, but the blast furnaces are still running. At Columbus, Ohio, the No. 2 furnace of the Carnegie Steel Company was flooded but No. 1 furnace was not interfered with. At Cleveland the Cuyahoga River was higher than has ever been known and blast furnaces on its banks, including the Central furnaces of the American Steel & Wire Company were forced to suspend operations. It is believed at this writing (Wednesday afternoon) that the Mingo Junction and Bellaire, Ohio, plants of the Carnegie Steel Company will be kept in operation.

The head waters of the Monongahela are in districts which were not visited by the heavy rainfall that swept over Ohio, and no serious flood trouble is anticipated at Pittsburgh. Blast furnaces and steel works there are all in operation.

A test of a 225-hp. Diesel oil engine is reported in pamphlet form, prepared for general distribution, by the Busch-Sulzer Bros.-Diesel Engine Company, St. Louis. The engine is installed in the plant of the Hugo Ice & Light Company, Hugo, Okla., and the test was conducted by Dr. A. C. Scott, of the Scott Engineering Company, Dallas, Tex. The performance of the engine, which was tested for a long range from no load to 245 hp., showed an efficiency over the greater part of the range of 0.48 to 0.44 lb. of oil per brake horsepower hour.

The Toledo Machine & Tool Company, Toledo, Ohio, is building an addition to its main shop of 100 x 150 ft., with crane runway the entire length. It will build a new power plant and pattern shop as soon as this addition is completed. Orders for the equipment for these enlargements are now being placed. Last fall the company erected a pattern and storage building, 90 x 115 ft., three stories. It reports trade very active. A large amount of business has been booked.

The C. O. Bartlett & Snow Company, Cleveland, Ohio, reports the receipt of orders for two skip hoists for coal and ashes for the American Rolling Mill Company, Middletown, Ohio; four dryers for the Canadian Cement Company, Montreal, Canada, and a coal tipple for the Cottonwood Coal Company, Stockett, Mont. These are in addition to a considerable number of small orders. The company reports a heavy demand for its entire line.

The old Kloman mine, at Republic, Mich., is reported to have been taken over by Chicago and other capital, which intends to develop the deposit and install a concentrating plant with which to treat the product, the ore existing in association with jasper. The last work at the Kloman, which has been in various hands at times in the past 25 years, was done by the John T. Jones Step furnace interests.

James B. Coryell has been appointed receiver for J. K. Dimmick & Co., coal, coke and pig iron merchants, Land Title Building, Philadelphia, Pa. Complications in their affairs resulted in an assignment for the benefit of creditors, followed by a petition asking for bankruptcy proceedings. The liabilities have been placed at about \$279,000, with assets somewhat below that figure.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

MERGER OF LEASE OF MACHINERY INTO SALE.—A contract for a lease of machinery with an option to purchase on payment of an amount in addition to the monthly rental installments fixed by the agreement was merged into a sale by the lessor-seller accepting a cash payment and notes covering the total amount, including such additional payment. (United States District Court, Middle District of Pennsylvania, in re Gaglione, 200 Federal Reporter 81.)

CARRIER'S LIABILITY FOR INJURY TO FREIGHT.—Freight received in good condition for carriage over connecting lines but delivered in bad order is presumed to have been damaged through the negligence of the last carrier, the burden being on it to show to the contrary. (Oregon Supreme Court, Lacey vs. Oregon Railway & Navigation Company, 128 Pacific Reporter 999.)

INJURY TO ROLLING MILL WORKMAN.—A workman in a rolling mill was injured by being caught in a loop of a hot bar of iron, due to the absence of an iron post intended to be set in the floor to prevent such injury. Defendant company furnished all the instrumentalities for the manufacturing operations. Held, that defendant is liable for the injuries, whether the workman be regarded as an employee of defendant or of the head roller who, under a contract dictated by a labor union, did all the actual work of manufacture in the mill according to a certain piece-work schedule, and employed, discharged and paid plaintiff and the other workmen under him. (Missouri Supreme Court, Jewell vs. Sturges, 151 Southwestern Reporter 966.)

DAMAGES RECOVERABLE FOR CARRIER'S DELAY.—The damages recoverable against a carrier for delay in transporting a casting used in a manufacturing establishment do not include profit lost through shutting down the factory, unless such loss was within the contemplation of the parties when the contract for shipment was made. (New Jersey Supreme Court, Higgins vs. United States Express Company, 85 Atlantic Reporter 450.)

DUTY TO GUARD MACHINERY UNDER FACTORY ACT.—The Indiana factory act requires employers to guard the parts of machinery enumerated by it, including shafting and setscrews if near where workmen are required to work and if it can be done without rendering the machinery useless for its intended purposes, though an employer need not guard against every possible danger or guard every piece of machinery, regardless of its location, though enumerated in the statute. (Indiana Appellate Court, H. A. McCowen & Co. vs. Gorman, 100 Northeastern Reporter 31.)

RESPONSIBILITY FOR INJURY TO MINOR EMPLOYEE.—A 15-year-old employee put to work at defective machinery in New York without an employment certificate being obtained as required by the laws of that State can recover for consequent injury without showing other negligence on the part of the employer. (New York Supreme Court, Second Appellate Division, Crowley vs. American Drug-gists' Syndicate, 138 New York Supplement 642.)

OPERATION OF THE NEW JERSEY WORKMEN'S COMPENSATION LAW.—The New Jersey workmen's compensation act governs a suit for injury to an employee occurring since the law took effect, where neither party disclaimed a purpose to be governed by the act. (New York Supreme Court, New York County Special Term, 138 New York Supplement 942.)

REQUIREMENTS AGAINST FOREIGN CORPORATIONS DOING BUSINESS IN PENNSYLVANIA.—Where an iron company, a foreign corporation, has its principal office in Ohio, four mines in Michigan, a business office in Pittsburgh, and a registered agent in Pennsylvania, it has sufficiently complied with the requirement of the Pennsylvania constitution and laws that no foreign corporation shall do business in the State without having one or more known places of business and an authorized agent or agents on whom process may be served, though it has not registered an additional agent or established another place of business where it stores its ores in yards leased for the purpose, to be smelted by a furnace company under a contract made in Ohio, by which the ores were to be sold and delivered to the furnace company from time to time, and paid for by pig iron delivered to the iron company and stored in the yards which it leased. (Pennsylvania Supreme Court, Dunbar Furnace Company vs. Pennsylvania Railroad Company, 85 Atlantic Reporter 106.)

RIGHTS OF PATENT LICENSEE.—Under a license to manufacture and sell a patented article at a monthly royalty, the licensee is entitled to retain and sell such articles as remain on hand at the expiration of such license. (Minnesota Supreme Court, Poirier vs. Bradford, 138 Northwestern Reporter 687.)

The tenth annual dinner of the metal merchants of New York City was held on the evening of March 25 at the Waldorf-Astoria. There was an attendance of 30, including guests, and all of the well known metal dealers were represented. P. R. Jennings, of Bruce & Cook, acted as toastmaster. The speeches were of an informal character. Among those present were James A. Farrell, president United States Steel Corporation; P. E. Strauss, Boston; A. J. Cohen, Philadelphia; R. B. Shearer, New Haven; A. Q. Moffatt, Philadelphia, and Frank Dickerson and John B. Carse, New York.

Newspaper reference has been made to an order issued by the Bethlehem Steel Company forbidding Sunday work at its plants at South Bethlehem, Pa. The policy of the company has been to eliminate Sunday work as far as possible in its machine shops and the purpose of the recent order is the more stringent prevention of Sunday operations. It does not apply to departments in continuous operation, such as blast furnaces, though the contrary impression was given by some recent publications.

The two blast furnaces being built by the Pittsburgh Steel Company at Monessen, Pa., will be completed in a few months. It is expected that one will be ready about June 1 and the other about July 1. They will have a combined daily capacity of about 800 tons. This company has a plant at Glassport, Pa., making hoops and bands, at which about 300 men struck last week for an advance of 15 per cent., which was granted after they were out for a few days.

The Western Pump & Engineering Company, with offices at 339-343 Railway Exchange Building, Chicago, has been organized to sell and install pumping machinery, air compressors and similar mechanical equipment. Joseph E. Bond, formerly chief engineer for the B. M. Osburn Company, is president, and Royal C. Wise, formerly mechanical engineer with Henion & Hubbell, is secretary. Particular attention will be given to McGowan pumping machinery.

The annual meeting of the New York and New Jersey Branch of the National Metal Trades Association will be held at 2.30 p. m., April 7, at the Astor House, Broadway and Vesey street, New York, at which time reports of the several departments will be made and the usual business transacted. John D. Hibbard, acting commissioner of the association, will attend the meeting.

The Paxton-Mitchell Company, Omaha, Neb., manufacturer of metallic packing and of aluminum, brass and bronze castings, which has operated a foundry since August, 1912, expects within the next few months to begin the construction of a gray-iron foundry.

The Massillon Iron & Steel Company, Massillon, Ohio, manufacturer of cast iron pipe and of heavy castings for blast furnaces and rolling mills, has been adding equipment recently which will make possible a considerable saving in labor.

The cost of living is to be made the sole subject of the sessions of the seventeenth annual meeting of the American Academy of Political and Social Science, to be held in Philadelphia, April 4 and 5. Professional and commercial organizations have been invited to participate.

The year book of the American Society of Mechanical Engineers for 1913, including alphabetical and geographical lists of membership, as well as the constitution, by-laws and rules of the society, has been issued. It appears that the total membership is 4542 against 4115 one year ago.

The Rochester Bridge Works, Rochester, Ind., which last year turned out 300 tons of structural steel a month, is now averaging 500 tons, with prospects of a further increase. It has recently booked some good contracts.

Customs Decisions

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Art Printing Presses

The board sustained a contention raised by Charles Hellmuth dealing with the classification of presses designed for printing half-tones. They were assessed at 45 per cent. ad valorem as manufactures of metal. The claim was made for duty at 30 per cent. as printing presses. The board holds that, as the presses have the usual characteristics of printing presses, they must be allowed to enter under that classification.

Bench Lathes

The United States Court of Customs Appeals has reversed the Board of General Appraisers in a case affecting the classification under the present tariff act of bench lathes operated exclusively by treadle. Bernard, Judae & Co. imported the machines, which were returned for duty at 45 per cent. ad valorem under paragraph 199, as manufactures of metal. The importers made the claim before the board that classification should have properly been made at 30 per cent. ad valorem under the provision in the law for machine tools. The board sustained the importers' protest. The court now reverses the board and holds that foot-power applied to a machine places it in the same category for the purposes of the customs as if it were driven by electricity, steam or water. The court therefore holds that the lathes were correctly assessed at 45 per cent. under the provision for manufactures of metal.

Meat Slicers

The court affirmed the board in a case relating to machines for slicing meats. The machines are used either by hand or other power, and were returned for duty at 45 per cent. They were alleged to be dutiable as machine tools at 30 per cent. Judge Barber holds that the machines, whether operated by hand or otherwise, are not in any sense machine tools. Gallagher & Ascher, the importers, are overruled.

Bronze Woven Wire

The board has decided that brass and bronze woven wire imported by J. F. McCoy & Co. and others is dutiable at 45 per cent. ad valorem under the provision in the present tariff law for manufactures of metal. The collector at New York assessed an additional duty under paragraph 135, at the rate of 1c. per lb., as goods made from wire. The board holds that the additional duty was unlawful. The rate at 45 per cent. is affirmed.

Beet Knives and Sharpeners

The board has taken adverse action on protests filed by A. G. Sherrard & Co., dealing with the classification of highly tempered steel file wheels and beet knives or shredders. The file wheels measured about 3 in. in diameter by 1/8 in. thick and are machine parts. They serve as a rotary file for use in sharpening the knives, which have 36 divisions or blades, corrugated in form and are finished parts of the machines. The various articles were all returned for duty under paragraph 199, at 45 per cent. ad valorem as manufactures of metal and were claimed to be machine tools, dutiable at 30 per cent. The board denied that the articles are in any sense machine tools.

Mica Trimmers and Ensilage Cutters

Mica trimmers and ensilage cutters imported by F. W. Myers & Co., at Plattsburgh, N. Y., were held not to be machine tools and therefore not entitled to enter at 30 per cent. as claimed. Assessment at 45 per cent. as manufactures of metal was affirmed.

The Universal Portland Cement Company announces that work has been started in the construction of its plant No. 7 to be located at Duluth, Minn., near the steel plant of the Minnesota Steel Company, also a subsidiary of the United States Steel Corporation. An expenditure of \$1,700,000 is contemplated in the building of the plant and its capacity will be 1,400,000 barrels of cement annually. This will augment the output of the Universal Portland Cement Company to an aggregate of 13,500,000 barrels per annum. Work is to be started on the new plant at once with the hope that it will be in operation in 1914. It will be electrically operated throughout, requiring a total of 5000 hp.

The Indiana Steel Company, Gary, Ind., is buying from the State of Indiana 90 lots of five acres each, of the bottom of Lake Michigan, the tract extending from the shore line to the Government dock, which is at the 25-ft. depth. The purchase is made to avoid shore line disputes, such as have occurred on the Chicago lake front. Under the contract the company fills in this land and notifies the State annually. A certified survey of the reclaimed area is then made and the company pays the State \$45 an acre for it. The company has the sole riparian rights to the land. The company has already filled in 100 acres, said to be worth now \$2500 an acre. Henry C. Frick and the Inland Steel Company, Indiana Harbor, are having similar surveys of the lake bottom made.

It has been announced at the Standard Oil Company's refinery at Wood River, Ill., near St. Louis, that within the next 30 days the refinery will begin the manufacture on a large scale of a new fluid fuel, which is to be called motor spirit, of which it is stated that large quantities can be made from crude oil without reducing the quantity of gasoline obtained therefrom. The gasoline percentage has been 20 per cent., it is stated, and this will be maintained, while the motor spirit will be 30 per cent. Its odor will prevent its use in pleasure vehicles, but motor trucks, traction engines, etc., will be able to use it.

The Citico furnace at Chattanooga, Tenn., which has been in successful operation for 25 years, but is not in condition to run longer without rebuilding, will be dismantled. The iron mines belonging to the Citico Furnace Company are being operated and the output sold to furnace companies. The furnace site, which is within the city limits and has become increasingly valuable, is to be sold.

The Meaker Company, Chicago, manufacturer of galvanizing equipment, is now operating 24 hours a day, though up to February 1, 1913, the company was able to take care of its orders by running on a 9-hour basis. The present business in the manufacture and installation of galvanizing equipment is at a rate nearly 100 per cent. in excess of that for 1912.

In *The Iron Age* of February 20 reference was made to the establishment of a large aluminum foundry at Waukesha, Wis., by Conrad Werra, Alex Pankratz and others. The name of the new company is the Werra Aluminum Foundry Company, and not the Werra Aluminum Company, as originally stated.

Personal

B. F. Fackenthal, Jr., after 20 years' service as president of the Thomas Iron Company, Hokendauqua, Pa., presented his resignation at the February meeting of the board of directors, and asked to be relieved of the offices of president and general manager of the company. His request was granted, with the regrets of the board, at the meeting March 19, to take effect May 1. As the vice-president, William H. Hulick, is unable by reason of his duties as vice-president of the Warren Foundry & Machine Company to assume the duties of acting president of the Thomas Iron Company, Mr. Hulick resigned as vice-president and Edwin Thomas of Catasauqua, Pa., was elected vice-president and appointed general manager, pending an election of president of the company.

C. H. Frank, formerly connected with the National Safe & Lock Company, has become secretary and treasurer of the J. D. Smith Foundry & Supply Company, Cleveland, Ohio.

E. D. Rogers, for the past nine years district sales manager of the Cambria Steel Company in Cleveland, Ohio, has resigned to accept the position of general manager of sales of the United Steel Company, Canton, Ohio, where he will be located after April 1. He will be succeeded in Cleveland by W. B. Smyth, who for some time has been assistant district sales manager of the Cambria Steel Company in that territory. After June 1 B. L. Little will be district sales manager of the United Steel Company in charge of the Chicago and Western territory. He has been with that company for the past nine years. A. Schaeffer, now Chicago district sales manager, will take charge of an office to be established by the United Steel Company in Cleveland.

A reorganization of the financial management of the M. Rumely Company, La Porte, Ind., has been brought about under the direction of the bankers associated in the financing of the company. Emmett Scott has been appointed treasurer, succeeding Dr. Edward A. Rumely, who continues as vice-president and general manager. In addition a new position has been created under the title of "vice-president in charge of finances," and to this position J. H. Guy has been elected. A finance committee, consisting of Dr. Rumely and representatives of Hallgarten & Co. and William Salomon & Co., has also been appointed. C. P. Holton, formerly identified with Gaar, Scott & Co., now one of the Rumely subsidiaries, has been made secretary.

L. H. Bailey, formerly associated with the Pacific coast office of Manning, Maxwell & Moore, Inc., is now with Harron, Rickard & McCone, San Francisco, machinery merchants.

Severn P. Ker, president Sharon Steel Hoop Company, Sharon, Pa., was one of the principal speakers at the second annual banquet of the Pittsburgh Association of Freight Agents held in that city on Thursday evening, March 20.

William H. Donner, president Cambria Steel Company, who recently returned to his office in Pittsburgh, after a three weeks' illness, has again been compelled to give up business cares and has gone to the Johns Hopkins Hospital, Baltimore, for treatment.

Leaf Lee, assistant chief engineer, has been made chief engineer of the Youngstown Sheet & Tube Company, Youngstown, Ohio, succeeding William F. Rust, who has been appointed general superintendent of the works of the Otis Steel Company, Cleveland.

George L. Drew is the new general manager of the Lebanon Valley Iron & Steel Company, Lebanon, Pa. He was formerly general manager of the Steel Company of Canada, Ltd., Hamilton, Ontario.

S. T. Fulton has been elected vice-president of the Railway Steel Spring Company. Other officers were re-elected.

John Stephens, for seven years superintendent of the plant of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., has resigned, effective April 1. W. L. Danks, connected with the company for six years, will succeed Mr. Stephens, who retires from active mill work and will travel, after putting in 54 years in the rolling-mill business in England and the United States. He was superin-

tendent at Newcastle, Pa., Sharon, Pa., Muncie, Ind., and Indiana Harbor, Ind.

J. W. White, engineering salesman for the Jeffrey Mfg. Company, located until recently at its Athens, Ohio, offices has been transferred to Duluth, Minn. He will look after the sales work of the company in the following territory: The eastern part of Minnesota, northern Wisconsin and the entire upper peninsula of Michigan, with headquarters at 1905 East Superior street, Duluth.

Abram Lucas, formerly general foreman of the locomotive department for the Chicago, Milwaukee & St. Paul Railroad at Milwaukee, Wis., has severed that connection to become associated with the Jacobs-Shupert U. S. Fire Box Company, with office at Chicago.

Arthur F. Braid, metallurgical engineer with the Goldschmidt Thermit Company, will be located for some time at the Chicago branch of that company, with offices at 7300 South Chicago avenue.

The last official act of President Wilson as Governor of the State of New Jersey was the appointment of W. L. Saunders, president Ingersoll-Rand Company, as a member of the New Jersey Harbor Commission.

Obituary

DANIEL F. COONEY, senior partner of D. F. Cooney & Co., 88 Washington street, New York, dealers in iron and steel, died March 16 after a long illness, aged about 67 years. He was a native of New York City and left school at an early age to enter the employ of James H. & John Haldane, iron merchants. When this firm dissolved and two new firms were formed in 1866, Mr. Cooney remained with James H. Haldane and became his partner. In 1875 James H. Haldane retired and Mr. Cooney continued the business in his own name until 1901 when he took in partnership his nephews, Andrew B. and Austin J. Murray, who had been in his employ since their boyhood. For the past ten years Mr. Cooney did not enjoy good health but continued to take an active interest in business, although forced to spend much time at home. He was a member of the New York Chamber of Commerce and of several clubs. His firm will be continued under the same style. Mr. Cooney had business relations with some of the leading iron and steel interests, among them the National Tube Company, Glasgow Iron Company and the American Iron & Steel Mfg. Company, and in the course of his long career won the high esteem of the trade.

SAMUEL AUGUSTUS BIGELOW, head of the Bigelow & Dowse Company, Boston, and dean of the hardware trade of New England, died suddenly March 20, of pneumonia, aged 74 years. He was born in Boston and at the age of 17 entered a local hardware house as an errand boy, shipper and general assistant in the office. He became a salesman and in 1864, when the firm of Homer, Bishop & Co. was founded, he was made a partner. In 1872 the firm dissolved and a new firm styled Macomber, Bigelow & Dowse was established. In 1894 the business was incorporated under its present name. In 1893 Mr. Bigelow was elected the first president of the New England Iron and Hardware Association. In 1894 he was the only representative from New England at the meeting in Cleveland when the National Hardware Association was launched, of which he was elected president in 1903, serving for two terms. The golden anniversary of his career in the business world, which occurred October 12, 1905, was a testimony to the universal esteem in which he was held in the hardware trade throughout the country. He was past president of the Anvil Club, afterward changed to the Hardware Buyers' Association, and a member of the Eastern Yacht, Exchange, Algonquin and Boston Art clubs and Boston Athletic Association. He leaves one son, Samuel Lawrence Bigelow, a professor of chemistry in the University of Michigan.

JOSEPH M. BUTLER, secretary and treasurer of H. Koppers Company, builder of by-product coke ovens, died March 23 at his home in Chicago after an illness of several weeks. Mr. Butler was connected with the manufacture of iron in the Mahoning Valley for a number of years. He was at one time secretary of the Brown-Bonnell Iron Company, Youngstown, Ohio, and for a time after the formation of the Republic Iron & Steel Company was ir-

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The Citico furnace at Chattanooga, Tenn., which has been in successful operation for 25 years, but is not in condition to run longer without rebuilding, will be dismantled. The iron mines belonging to the Citico Furnace Company are being operated and the output sold to furnace companies. The furnace site, which is within the city limits and has become increasingly valuable, is to be sold.

The Meaker Company, Chicago, manufacturer of galvanizing equipment, is now operating 24 hours a day, though up to February 1, 1913, the company was able to take care of its orders by running on a 9-hour basis. The present business in the manufacture and installation of galvanizing equipment is at a rate nearly 100 per cent. in excess of that for 1912.

In *The Iron Age* of February 20 reference was made to the establishment of a large aluminum foundry at Waukesha, Wis., by Conrad Werra, Alex Pankratz and others. The name of the new company is the Werra Aluminum Foundry Company, and not the Werra Aluminum Company, as originally stated.

Personal

B. F. Fackenthal, Jr., after 20 years' service as president of the Thomas Iron Company, Hokendauqua, Pa., presented his resignation at the February meeting of the board of directors, and asked to be relieved of the offices of president and general manager of the company. His request was granted, with the regrets of the board, at the meeting March 19, to take effect May 1. As the vice-president, William H. Hulick, is unable by reason of his duties as vice-president of the Warren Foundry & Machine Company to assume the duties of acting president of the Thomas Iron Company, Mr. Hulick resigned as vice-president and Edwin Thomas of Catasauqua, Pa., was elected vice-president and appointed general manager, pending an election of president of the company.

C. H. Frank, formerly connected with the National Safe & Lock Company, has become secretary and treasurer of the J. D. Smith Foundry & Supply Company, Cleveland, Ohio.

E. D. Rogers, for the past nine years district sales manager of the Cambria Steel Company in Cleveland, Ohio, has resigned to accept the position of general manager of sales of the United Steel Company, Canton, Ohio, where he will be located after April 1. He will be succeeded in Cleveland by W. B. Smyth, who for some time has been assistant district sales manager of the Cambria Steel Company in that territory. After June 1 B. L. Little will be district sales manager of the United Steel Company in charge of the Chicago and Western territory. He has been with that company for the past nine years. A. Schaeffer, now Chicago district sales manager, will take charge of an office to be established by the United Steel Company in Cleveland.

A reorganization of the financial management of the M. Rumely Company, La Porte, Ind., has been brought about under the direction of the bankers associated in the financing of the company. Emmett Scott has been appointed treasurer, succeeding Dr. Edward A. Rumely, who continues as vice-president and general manager. In addition a new position has been created under the title of "vice-president in charge of finances," and to this position J. H. Guy has been elected. A finance committee, consisting of Dr. Rumely and representatives of Hallgarten & Co. and William Salomon & Co., has also been appointed. C. P. Holton, formerly identified with Gaar, Scott & Co., now one of the Rumely subsidiaries, has been made secretary.

L. H. Bailey, formerly associated with the Pacific coast office of Manning, Maxwell & Moore, Inc., is now with Harron, Rickard & McCone, San Francisco, machinery merchants.

Severn P. Ker, president Sharon Steel Hoop Company, Sharon, Pa., was one of the principal speakers at the second annual banquet of the Pittsburgh Association of Freight Agents held in that city on Thursday evening, March 20.

William H. Donner, president Cambria Steel Company, who recently returned to his office in Pittsburgh, after a three weeks' illness, has again been compelled to give up business cares and has gone to the Johns Hopkins Hospital, Baltimore, for treatment.

Leaf Lee, assistant chief engineer, has been made chief engineer of the Youngstown Sheet & Tube Company, Youngstown, Ohio, succeeding William F. Rust, who has been appointed general superintendent of the works of the Otis Steel Company, Cleveland.

George L. Drew is the new general manager of the Lebanon Valley Iron & Steel Company, Lebanon, Pa. He was formerly general manager of the Steel Company of Canada, Ltd., Hamilton, Ontario.

S. T. Fulton has been elected vice-president of the Railway Steel Spring Company. Other officers were re-elected.

John Stephens, for seven years superintendent of the plant of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., has resigned, effective April 1. W. L. Danks, connected with the company for six years, will succeed Mr. Stephens, who retires from active mill work and will travel, after putting in 54 years in the rolling-mill business in England and the United States. He was superin-

tendent at Newcastle, Pa., Sharon, Pa., Muncie, Ind., and Indiana Harbor, Ind.

J. W. White, engineering salesman for the Jeffrey Mfg. Company, located until recently at its Athens, Ohio, offices has been transferred to Duluth, Minn. He will look after the sales work of the company in the following territory: The eastern part of Minnesota, northern Wisconsin and the entire upper peninsula of Michigan, with headquarters at 1905 East Superior street, Duluth.

Abram Lucas, formerly general foreman of the locomotive department for the Chicago, Milwaukee & St. Paul Railroad at Milwaukee, Wis., has severed that connection to become associated with the Jacobs-Shupert U. S. Fire Box Company, with office at Chicago.

Arthur F. Braid, metallurgical engineer with the Goldschmidt Thermit Company, will be located for some time at the Chicago branch of that company, with offices at 7300 South Chicago avenue.

The last official act of President Wilson as Governor of the State of New Jersey was the appointment of W. L. Saunders, president Ingersoll-Rand Company, as a member of the New Jersey Harbor Commission.

Obituary

DANIEL F. COONEY, senior partner of D. F. Cooney & Co., 88 Washington street, New York, dealers in iron and steel, died March 16 after a long illness, aged about 67 years. He was a native of New York City and left school at an early age to enter the employ of James H. & John Haldane, iron merchants. When this firm dissolved and two new firms were formed in 1866, Mr. Cooney remained with James H. Haldane and became his partner. In 1875 James H. Haldane retired and Mr. Cooney continued the business in his own name until 1901 when he took in partnership his nephews, Andrew B. and Austin J. Murray, who had been in his employ since their boyhood. For the past ten years Mr. Cooney did not enjoy good health but continued to take an active interest in business, although forced to spend much time at home. He was a member of the New York Chamber of Commerce and of several clubs. His firm will be continued under the same style. Mr. Cooney had business relations with some of the leading iron and steel interests, among them the National Tube Company, Glasgow Iron Company and the American Iron & Steel Mfg. Company, and in the course of his long career won the high esteem of the trade.

SAMUEL AUGUSTUS BIGELOW, head of the Bigelow & Dowse Company, Boston, and dean of the hardware trade of New England, died suddenly March 20, of pneumonia, aged 74 years. He was born in Boston and at the age of 17 entered a local hardware house as an errand boy, shipper and general assistant in the office. He became a salesman and in 1864, when the firm of Homer, Bishop & Co. was founded, he was made a partner. In 1872 the firm dissolved and a new firm styled Macomber, Bigelow & Dowse was established. In 1894 the business was incorporated under its present name. In 1893 Mr. Bigelow was elected the first president of the New England Iron and Hardware Association. In 1894 he was the only representative from New England at the meeting in Cleveland when the National Hardware Association was launched, of which he was elected president in 1903, serving for two terms. The golden anniversary of his career in the business world, which occurred October 12, 1905, was a testimony to the universal esteem in which he was held in the hardware trade throughout the country. He was past president of the Anvil Club, afterward changed to the Hardware Buyers' Association, and a member of the Eastern Yacht, Exchange, Algonquin and Boston Art clubs and Boston Athletic Association. He leaves one son, Samuel Lawrence Bigelow, a professor of chemistry in the University of Michigan.

JOSEPH M. BUTLER, secretary and treasurer of H. Koppers Company, builder of by-product coke ovens, died March 23 at his home in Chicago after an illness of several weeks. Mr. Butler was connected with the manufacture of iron in the Mahoning Valley for a number of years. He was at one time secretary of the Brown-Bonnell Iron Company, Youngstown, Ohio, and for a time after the formation of the Republic Iron & Steel Company was ir-

the general offices of the company at Chicago. He was a nephew of Joseph G. Butler, Jr., of Youngstown.

CHARLES KELLOGG, president of the Imperial Pneumatic Tool Company and organizer of the Elmira Bridge Company and the Athens Boiler Works Company, is dead at his home, in Athens, Pa., aged 76 years. He was a member of the American Society of Civil Engineers, the Engineers' Club of New York, and the National Geographical Society. He was once mayor of Athens.

PETER CHALMERS, proprietor of Chalmers & Co. and the Winship Mfg. Company, Racine, Wis., iron and brass founders, died recently. His eccentricities caused him to be exceptionally well known. Among them was a preference for the life of a recluse.

Pittsburgh and Vicinity Notes

W. N. Kratzer & Co., Pittsburgh, recently fabricated a girder to be placed in a theater now being erected in that city, which measures 10 ft. 3 in. over all in width in the center, is 106 ft. 8 in. long and weighs 66 tons. It is said to be the largest girder ever fabricated in Pittsburgh.

The Dempsy-Degener Company, Pittsburgh, has closed a contract with the Union Ice Company of that city for coal and ash handling equipment for its entire plant, including motors, fans, blowers, etc.

The Fort Pitt Spring & Mfg. Company, Pittsburgh, is building an addition to its plant at McKees Rocks, 100 x 300 ft., in which new equipment will be installed, considerably increasing the capacity for the manufacture of coil and elliptic springs.

The William H. Page Boiler Company, New Castle, Pa., has given a contract to the Harper Lumber & Building Company for an addition to its foundry, 51 x 100 ft., in which core ovens will be installed.

The Leetonia Steel Company, recently organized to build an open-hearth steel plant and sheet mills at Leetonia, Ohio, details of which were given in *The Iron Age* of March 13, has been incorporated under the laws of Ohio with a capital stock of \$2,000,000, the incorporators being Hugh Smith, Archie Smith, N. J. McKeefrey, Albert P. Myer and Ralph N. Curry.

The plant of the Pittsburgh Safe Company at Connelville, Pa., has been leased by H. G. Moorean, superintendent, from John D. Sherrick and H. G. Cochran, who have operated it under a partnership for some time.

The Youngstown Pattern Company, Youngstown, Ohio, has been reorganized and incorporated under the laws of Ohio and is now owned by A. W. Craver and N. Forsyth.

The Laughlin & Barney Machinery Company, Union Bank Building, Pittsburgh, has sold a 10-ton Case electric traveling crane to the National Metal Molding Company, Corry, Pa.

The Kittanning Fire Brick Company, Kittanning, Pa., has increased its capital stock from \$5000 to \$40,000, and will make some improvements and extensions to its works.

The Shenango Furnace Company, Sharpsville, Pa., is installing a plant to crush blast furnace slag for use in building roads.

The Erie Engine Company, Erie, Pa., has increased its capital stock from \$300,000 to \$600,000 and will make some large additions to its plant.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers will be held in Fort Wayne, Ind., commencing Tuesday, May 13. It is probable that the annual convention of the United Sons of Vulcan, composed of puddlers employed in some of the bar iron mills of Pittsburgh and the West will be held in Pittsburgh this year.

The Riter-Conley Mfg. Company, Pittsburgh, is now pushing work on its contract for the Los Angeles aqueduct, involving $5\frac{1}{2}$ miles of triple-riveted lap steel pipe, varying from 64 to 68 in. in diameter, made from 5-16 and $\frac{3}{4}$ in. steel plates, the total weight being about 4200 tons. The pipe is fabricated in single plates to the ring and is being shipped, knocked down and nested, at the rate of 1500 tons per month.

William Swindell & Brothers, Jenkins Arcade, Pittsburgh, have received contracts for annealing furnaces and

gas producers from the Weirton Steel Company, Weirton, W. Va., and for two large gas fired annealing furnaces from the Kelly & Jones Company, Greensburg, Pa. They are installing additional gas producer equipment for the Mosler Safe Company, Hamilton, Ohio; Alan Wood Iron & Steel Company, Ivy Rock, Pa.; Union Horse Nail Company, Chicago, and Simonds Mfg. Company, Chicago. They recently completed stoker-fired heating and annealing furnaces for the New Castle and Middletown, Pa., plants of the Standard Steel Car Company and are installing a 25-ton stoker-fired air melting furnace for the Ingersoll-Rand Company, Phillipsburg, N. J., on all of which the Jones underfeed stoker is used.

The Braeburn Steel Company, Braeburn, Pa., manufacturer of tool steel, has recently completed the building of a new heating furnace and the rebuilding of several of the old furnaces, changing them from gas to direct coal-burning furnaces. New producers have been installed, which are giving economical results from the company's crucible melting furnaces. A complete hardening and tempering plant has been provided, together with a physical laboratory to be used in connection with the chemical laboratory for experimental work. A new 500-ton steam hydraulic forging press has been ordered, which will be installed in the near future. The capacity of the warehouse at Braeburn has been doubled and the company is now carrying a correspondingly increased stock of finished material.

The contract for the new intake for the water works of the McClintic-Marshall Construction Company at Rankin, Pa., has been awarded to the Dravo Contracting Company, Pittsburgh. Chester & Fleming are engineers.

Paul T. Buckler, Pittsburgh representative of the Detroit Stoker Company, has received a contract for nine stokers to be placed in the Lower Union mills of the Carnegie Steel Company at Pittsburgh. These stokers are to operate four 300-hp. Sterling boilers, four 375-hp. Babcock & Wilcox boilers and one 400-hp. Erie City Iron Works boiler.

The regular monthly meeting of the Pittsburgh Foundrymen's Association will be held on Monday evening, April 14. H. M. Lane, Detroit, is expected to present a paper on "The Control of Temperatures and Other Conditions in Core-Oven Practice."

The H. J. Heinz Company, North Side, Pittsburgh, now building a new power house, has placed an order with the Pittsburgh agent of the Green Engineering Company for mechanical stokers to operate five 600-hp. Heine water tube boilers.

No. 1 furnace at the Shoenberger works of the American Steel & Wire Company, Pittsburgh, has been blown out for relining and repairs.

No. 5 blast furnace of the Jones & Laughlin Steel Company, Pittsburgh, out of blast for some time for relining and repairs, was blown in last week. This company is now operating all its furnaces, consisting of the five Eliza and one Soho, in Pittsburgh, and the four stacks at Aliquippa, Pa.

The Standard Steel Car Company, Butler, Pa., has asked the city to vacate a portion of a street to allow an extension of its plant, which will be the second in a short time. About 30 houses will be torn down or moved.

B. F. Robbins, purchasing agent of the Taylor-Wharton Iron & Steel Company, High Bridge, N. J., announces that hereafter the major portion of miscellaneous supplies for that company will be purchased by Louis Koppenhoefer, purchasing agent of William Wharton, Jr., & Co., Inc., at Twenty-fifth street and Washington avenue, Philadelphia.

The Kinney Mfg. Company, Boston, Mass., manufacturer of positive pressure rotary pumps, has opened an office in Chicago, at 111-115 West Monroe street, in charge of Carl Heim. This company's pump is especially adapted for the handling of coal tar, ammonia water, oils, brine, glue, paint, varnish and heavy liquids in general.

The Pennsylvania Shafting Company, Spring City, Pa., manufacturer of cold-drawn turned and polished steel shafting and cold-drawn shapes, is making plans for an addition to its plant which will be used for the manufacture of taper roller bearings.

Bethlehem Steel Corporation's Report

The Bethlehem Steel Corporation's report for the year ended December 31, 1912, makes the following income showing, as compared with that for the previous year:

	1912.	1911.
Net manufacturing profit after deducting expenditures for ordinary and extraordinary repairs and maintenance, approximately \$2,712,000 in 1912 and \$2,850,000 in 1911	\$4,846,814	\$4,605,410
Other income	267,626	187,303
Total income	\$5,114,440	\$4,792,713
Interest on notes	159,437	210,886
Interest on funded debt	1,844,478	1,654,700
Depreciation	790,578	675,000
Provision for extinguishment of mining investments, amortization of patents, etc.	256,306	213,148
Total deduction	\$3,050,798	\$2,753,734
Surplus	2,063,640	2,038,979
Discount on securities	854,354	
Appropriation from surplus for additions and working capital	7,500,000	
Previous surplus	7,308,667	5,269,688
P & L surplus	\$1,017,954	\$7,308,667

The balance sheet shows an increase in assets from \$75,077,255 to \$84,418,952. The funded debt increased from \$26,291,533 to \$32,441,533.

The orders booked during the year and on hand at the close of each of the past eight years are given in the following table:

	Booked during year.	On hand at end of year.
1912	\$47,030,504	\$29,282,182
1911	28,607,561	15,885,198
1910	29,580,572	17,370,660
1909	28,696,516	14,073,834
1908	14,458,997	7,592,502
1907	15,615,018	8,425,736
1906	16,216,570	13,300,885
1905	18,123,129	14,466,307

President Charles M. Schwab's accompanying statement is in part as follows:

The unfavorable business conditions prevailing during the latter part of 1911 extended through the first half of 1912, notwithstanding which the earnings of the corporation and its subsidiary companies were again the largest since its incorporation. The improvement in business the latter part of the year enabled the subsidiary companies to secure orders for the year 60 per cent. greater than the best previous year and the orders on hand at the beginning of 1913 (\$29,282,182 against the best previous record of \$17,370,660) would seem to insure very satisfactory earnings for the coming year.

The greater part of the surplus accumulated from earnings since the formation of the corporation has been put back into the business, either for extensions and additions to plants and properties or as working capital which, while constantly fluctuating, has necessarily increased with the increased business of the enlarged plants.

During the year the Bethlehem Steel Company refunded its outstanding five-year 6 per cent. notes and acquired a part (\$2,668,000) of its first extension mortgage bonds by the sale of \$15,200,000 out of an authorized issue of \$50,000,000 of its first lien and refunding bonds; \$2,668,000 of the first extension mortgage bonds were pledged under the first lien and refunding mortgage. The bonds so pledged may be applied for purposes of the sinking fund of the first extension mortgage in the face amount thereof not in excess of \$325,000 per year; \$315,000 of said bonds were so applied on July 1, 1912. The proceeds of the bonds sold provided also for certain plant improvements, for a material decrease in outstanding commercial paper and otherwise for necessary increased working capital. There remains for issue \$34,800,000 of these bonds, the sale of which from time to time will provide for the refunding of payment at maturity of the \$8,000,000 first extension bonds now outstanding and in the hands of the public, and for improvements and additions to the corporation's properties for considerable future time.

The Bethlehem Steel Company has recently obtained control of valuable and extensive iron ore deposits near Coquimbo, Chile. These mines have been in operation for some years, and the ore is of the highest quality ever commercially used for the manufacture of pig-iron, being unusually rich in iron and free from deleterious impurities. The iron content runs about 67 per cent., or about 17 per cent. more than the average of present Lake Superior ores, and three tons of this ore will, therefore, replace about

four tons of such ore as is of most common use in this country. No railroad is necessary at the mines, as they are situated so near the coast that the ore is handled by gravity with a wire rope tramway. The ore lies on the surface, requiring no underground mining, and there is no dirt capping requiring stripping. As a result of these conditions the ore will be loaded on board ship at an extremely low price per ton. A new company (Bethlehem Chile Iron Mines Company) has been incorporated under the laws of Delaware for the operation of these mines. Unless it shall be possible to place the transportation of this ore on a long-term contract at a favorable rate, the present plans contemplate the building of a large fleet of specially designed ships for carrying this ore from Chile to the United States, but these plans and the method of financing so large an operation are not yet sufficiently definite for announcement. The officers and engineers of the corporation consider the acquisition of this ore one of the most important developments in its history.

Prevention of Blast Furnace Accidents

Safety Bulletin No. 1, issued by the Inland Steel Company, Chicago, for distribution among its employees at Indiana Harbor, Ind., contains an article on the prevention of blast furnace accidents by J. E. Thropp, Jr., superintendent of blast furnaces. Mr. Thropp says that while work around blast furnaces is generally considered dangerous because of the presence of gas, the danger of slips, and break-outs of molten metal, most of the accidents are due to other causes. In 1912 the accidents at the Indiana Harbor blast furnaces were distributed as follows: Blast furnace operations, 20 per cent.; mechanical department, 33 per cent.; yard department, 33 per cent.; switching yards, 14 per cent. The following suggestions are given:

If the presence of gas is suspected around the hearth, light it with a piece of burning waste so as to avoid danger of being gassed.

Furnace keepers and helpers must be sure that tapping holes, iron runners and shutters are perfectly dry before using them. A little damp clay or wet scrap may cause an explosion.

Keep away from cinder ladles when they are being filled, especially in wet weather.

Attention is called to the danger of driving keys to support bootlegs, or tightening nuts on tuyere caps, doors of stoves, etc., when the blast is on.

Avoid working under dust catchers when furnace is hanging. Keep away from the tuyeres and avoid looking in the peep sights unless it is one of your duties.

Men working in boiler house should see that slide is well mudded, and that "Danger—Do Not Move" signs are hung on gas valve and blow-off valve to prevent possibility of gas or steam getting in the boiler.

Beware of hot flue dust. It will run like water when it strikes the ground or any damp or wet surface and will cause a serious burn if it gets in your shoes. Either wet it down with a hose or get a plank to stand on when shoveling it away.

Bear in mind that practically all blast furnace accidents can be avoided by using common sense, keeping your eyes open and not taking chances. The human element is the most important factor in accident prevention and should receive the greatest attention.

International Mining and Metallurgy Congress

One of the largest of the great scientific and industrial congresses is to be held in London in the early part of June, 1915. This is the Sixth International Congress of Mining, Metallurgy, Applied Mechanics and Practical Geology. These congresses take place at intervals of five years. The last, which was brilliantly successful, was held at Düsseldorf in 1910, previous congresses having been held in Paris and Liege. The attendance at Düsseldorf was over 2000. An influential committee has been formed in London to make the necessary arrangements, and the movement is being actively supported by the University of London, Imperial College of Science and Technology, Geological Society of London, Institution of Mechanical Engineers, Iron and Steel Institute, Society of Chemical Industry, Institution of Mining Engineers, Institution of Mining and Metallurgy, Institute of Metals, South Wales Institute of Engineers, Cleveland Institution of Mining Engineers, West of Scotland Iron and Steel Institute, Staffordshire Iron and Steel Institute, Sheffield Society of Engineers and Metallurgists, and by numerous firms interested in the various industries represented.

Railroad Effort for Rail Improvement

Progress Reported at American Railway Engineering Association Meeting— The Investigations of the Past Year

The annual meeting of the American Railway Engineering Association at the Congress Hotel, Chicago, March 18 to 21 inclusive, brought out a record attendance. The sessions were given over very largely to strictly railroad problems, but at the opening session on Tuesday the report of the Committee on Rail brought out a number of points of interest to the manufacturers. The committee presented a set of specifications for carbon steel rails at the annual convention in 1912, and it was adopted by the association. Some criticisms have since been made, and the committee went over the specifications with a view to making them more perfect. Several changes were submitted, of which the following are the most important:

The words "of each heat" have been added to Section 4, so that it now provides for the determining of the chemical composition of each heat of the steel from which the rails are rolled. To the Elongation or Ductility section, the following paragraph has been added: "A sufficient number of blows shall be given to determine the complete elongation of the test piece of at least every fifth heat of Bessemer steel and of one out of every three test pieces of a heat of open-hearth steel." A number of minor changes were made in the section relating to Bessemer and open-hearth process drop tests. In the section on Straightening this new clause was added: "Rails heard to snap or check while being straightened shall be at once rejected." To the Finishing section this clause was added: "When any finished rail shows interior defects at either end or in a drilled hole, the entire rail shall be rejected."

Rail Sections

The committee had delegated to it by the American Railway Association the question of rail section. It collected the sections used by the various railroads, and members of the committee submitted sections for consideration, the desire being to keep the section within certain limits so that rail joints could be used and have a bearing on the straight portion of the rail both under the head and on top of the base with as little additional stress on the bolts as possible. The committee was not ready to recommend a new section, as the so-called A. R. A. types A and B had been used by a number of roads, but only for about three years at the most. The committee recommended adding a little metal to the fillets both under the head and at the base. It has under consideration modified sections and will continue its investigation, also making a study of rail joints for a future report.

The statistics of rail failures for the year ending October 31, 1911, were based on more complete responses than ever, the information furnished relating to 12,893,007 tons of rails. The committee states that it is impossible to make comparisons under similar conditions of traffic, road-bed and weight of rail when dealing with the reports from companies whose problems vary widely. The record of comparative wear of special rails is being kept, however, in order to make comparison possible.

M. H. Wickhorst's Investigations

M. H. Wickhorst, engineer of tests for the committee, has continued his work in the past year. His reports cover abrasion tests of rails on a revolving machine; influence of titanium on Bessemer ingots and rails; pipeless ingots; transverse ductility of base of rails, and influence of silicon on open-hearth ingots and rails. The five reports are summarized as follows:

The first report gave the results of abrasion tests of rails made at several different mills. The tests were made at the South Chicago works of the Illinois Steel Company on a "revolving machine," consisting of a circular track 20 ft. in diameter, on which a heavy beam revolved which could be given additional load by means of springs. Under the conditions of this test open-hearth steel of 0.74 per cent. carbon abraded more slowly than Bessemer steel of 0.50 to 0.54 per cent. carbon, but the tests were not entirely satisfactory and were few in number.

TITANIUM FOR BESSEMER RAILS

The next study gave the results of an investigation made at the works of the Lackawanna Steel Company at Buffalo, to determine the influence of titanium on Bessemer steel ingots and rails. A series of heats was made with treatments varying from nothing to 0.6 per cent. metallic titanium added in the form of a cold 15 per cent. alloy. According to the results obtained, the use of amounts of 0.1 per cent. or more of metallic titanium in the manner mentioned, prevents the "honey-combed" condition of the upper part of the ingot found in plain Bessemer steel, but was also attended with a larger and deeper "pipe." The heavy segregation or concentration of carbon, phosphorus and sulphur found in the interior and upper part of ingots of plain Bessemer steel was largely restrained, but the mild negative segregation found in the interior and lower part of the ingot was not materially altered. The brittle zone found in rail of plain Bessemer steel from the upper part of the ingot, as determined by drop and tensile tests, was avoided, but the properties of the rail from the lower two-thirds of the ingot were not changed. Large internal flaws were found in rail considerably lower down from the top of the ingot in steel treated as mentioned, than in rail made from plain steel. Treatments with 0.05 per cent. metallic titanium produced the above results only in part, but treatment above 0.1 per cent. had only little additional influence.

The third report dealt with an investigation of two special ingots made by the Standard Steel Works Company at Burnham, Pa., by a process which prevents the formation of a "pipe" in the interior of the ingot. The steel was acid open-hearth steel treated with titanium. The ingots were shipped to the Maryland Steel Company at Sparrows Point, Md., where they were tested. The main feature of the casting process was a sand core on top of the iron mold. The ingots were cupped down at the top, but contained no interior pipe.

The fourth report described a method for determining the transverse ductility of the bottom of the base of a rail and the load required to break the flanges of a rail supported near the edges of the flanges. The results were given of a few tests made at Buffalo at the works of the Lackawanna Steel Company, of Bessemer and open-hearth rails. The method of making the tests was to support a piece of rail about two ft. long on two supports placed opposite each other near the edges of the flanges under the middle of the length of the rail. The supports were six in. long and placed one-half in. in from the sides of the flanges. The load was applied in the test machine to the top of the rail at the middle. The method may be considered a means of determining the strength of the flange and of determining the transverse properties of the base of the rail, as regards the transverse ductility of the metal in the base and the presence of structural flaws such as seams.

SILICON IN OPEN-HEARTH RAIL STEEL

The last report gave the results of an investigation made at the Gary works of the Illinois Steel Company on the influence of silicon on open-hearth ingots and rails. A heat of about 0.15 per cent. silicon was used and a series of higher silicons in this steel up to above 0.5 per cent. was obtained by means of mold additions of finely crushed ferro-silicon. With about $\frac{1}{4}$ per cent. silicon or more the ingots were free from most of the honeycomb present in the upper third of the ingot with the heat amount of silicon, but they also had larger pipes. The higher silicons also had less concentrated segregation of carbon, phosphorus and sulphur. Silicon had but little influence on the results in the drop test. When tested in the test machine as a beam, the stiffness and breaking load of the rails increased with increase of silicon, while their ductility was not greatly influenced. In longitudinal tensile tests the yield point and tensile strength increased somewhat with the increase of silicon, while the ductility re-

mained about the same. In tests of the flange the load required to break the flange increased somewhat as the silicon increased, while the transverse ductility of the base remained about the same.

The above work concerning both titanium and silicon indicates that they tend to restrain segregation of carbon, phosphorus and sulphur, but used as they were in this work they were attended with larger pipes. This suggests the idea that in order to obtain the full benefits of their use a method of casting the ingots is necessary whereby the pipe is avoided or minimized.

The question of testing each ingot was thoroughly considered correspondence and the committee recommends that no change be made in the specifications in this respect at present.

Seams in Rails to Be Investigated

Concerning Mr. Wickhorst's investigations in the coming year, the committee stated that while the type of rail failure most common a few years ago—split and mashed heads—was traceable to the interior condition of the ingot, thus making ingot studies important, the recent failures, due largely to last winter's crop of broken rails, seemed to be largely attended, or perhaps caused, by deep seams at the base of the rail. It is now proposed that the work of the immediate future be directed toward throwing light on the cause of such seams, and methods for their prevention.

Half the Failures Go Back to the Ingot

Mr. Wickhorst commented as follows on the relation of rail failures to steel works processes: "Taking the statistics of rail failures as published in one of our recent bulletins, 90 per cent. of the failures can be divided into two general classes. First of all, we have failures of the crushed heads, split heads, and also in that should probably be included most of the web failures. This class of failures is traceable finally to the interior condition of the ingot from which the rails were made; that is, they are a matter of excessive segregation, which produces a brittleness in the interior of the section. Under wheel loads the head spreads sideways. The top metal is always ductile, but the interior metal may not be so, sometimes due to structural flaws or laminations, but most particularly due to excessive carbon and phosphorus, which makes extremely brittle non-ductile material inside, so that when the top of the head spreads sideways a crack develops internally and finally comes to the surface at the under side of the head at its junction with the web. Sometimes, in the case of a badly segregated rail, it will run farther into the web and come out to the surface at the side of the web. So a good many failures, classed as web failures, would come under that head. That would include probably 50 per cent. of the failures. Then, second in the class, we have broken bases and broken rails, which, I will simply state very briefly, we think we can now definitely trace to a seam in the bottom of the base. If the bottom of the base contains a seam when excessive load comes on, or if there is an eccentric bearing, then the seam opens, and if the seam happens to be away from the center a piece of the flange may break out and we get a moon-shaped or crescent break. If, however, as is more generally the case, the seam opens up near the center of the base, the base will open up and a piece of the flange start to break off, and then the break goes through the whole of the section. So what are classed as broken rails (square breaks—angular breaks), and base breaks in general, can be traced to the presence of a longitudinal seam in the bottom of the base. This will probably include about 40 per cent. of the rail failures. These two classes will account for about 90 per cent. of all the rail failures of the country. Then we may say 50 per cent. of the rail problems consists in getting sound metal of fairly even composition and 40 per cent. consists in so rolling the steel as to avoid the seams in the base."

The Camden Forge Company, Camden, N. J., after several years of experimental research, is enlarging its steel heat treatment plant by the installation of annealing furnaces and quenching facilities. The first unit of this installation is now in operation. The company handles outside work.

The National Railway Appliances Exhibit

The exhibit of the National Railway Appliances Association held at the Coliseum, Chicago, March 18 to 21, simultaneously with the meetings of the American Railway Engineering Association, excelled the unusually high standard to which this exhibit has attained in past years since being held at that place. Equipment and a wide variety of railroad appliances were elaborately shown in both a practical and artistic manner. A partial list of the exhibitors, omitting those who are exclusive manufacturers of railroad supplies, is as follows:

Ajax Forge Company, Chicago, Ill.
American Hoist & Derrick Company, Chicago, Ill.
American Lock Nut Company, Chicago, Ill.
American Steel & Wire Company, Chicago, Ill.
American Valve & Meter Company, Cincinnati, Ohio.
Barrett Mfg. Company, Chicago, Ill.
Bausch & Lomb Optical Company, Rochester, N. Y.
Beaver Dam Malleable Iron Company, Beaver Dam, Wis.
Block-Brennan Refining Company, Chicago, Ill.
S. F. Bowser & Co., Inc., Fort Wayne, Ind.
Bucyrus Company, South Milwaukee, Wis.
Carnegie Steel Company, Pittsburgh, Pa.
George B. Carpenter & Co., Chicago, Ill.
Chicago Bridge & Iron Works, Chicago, Ill.
Chicago Pneumatic Tool Company, Chicago, Ill.
Cleveland Frog & Crossing Company, Cleveland, Ohio.
Clyde Iron Works, Duluth, Minn.
Cook's Standard Tool Company, Kalamazoo, Mich.
Crerar, Adams & Co., Chicago, Ill.
Des Moines Bridge & Iron Company, Pittsburgh, Pa.
Detroit Graphite Company, Detroit, Mich.
Dilworth, Porter & Co., Ltd., Pittsburgh, Pa.
Joseph Dixon Crucible Company, Jersey City, N. J.
G. Drouve Company, Bridgeport, Conn.
Duplex Metals Company, Chester, Pa.
Elyria Iron & Steel Company and Hart Steel Company, Elyria, Ohio.
Fairbanks, Morse & Co., Chicago, Ill.
Fairmont Machine Company, Fairmont, Minn.
General Electric Company, Schenectady, N. Y.
Grip Nut Company, Chicago, Ill.
Hubbard & Co., Pittsburgh, Pa.
Indianapolis Switch & Frog Company, Springfield, Ohio.
Ingalls-Shepard Forging Company, Harvey, Ill.
Inland Steel Company, Chicago, Ill.
International Harvester Company of America, Chicago, Ill.
H. W. Johns-Manville Company, New York, N. Y.
Kelly-Derby Company, Chicago, Ill.
Kennicott Company, Chicago, Ill.
Kenuff & Esser Company of New York, Chicago, Ill.
Keystone Driller Company, Beaver Falls, Pa.
Keystone Grinder & Mfg. Company, Pittsburgh, Pa.
Lackawanna Steel Company, Buffalo, N. Y.
Lidgerwood Mfg. Company, Chicago, Ill.
Lorain Steel Company, Johnstown, Pa.
Lufkin Rule Company, Saginaw, Mich.
Luitwieler Pumping Engine Company, Rochester, N. Y.
David Lupton's Sons Company, Philadelphia, Pa.
Morden Frog & Crossing Works, Chicago, Ill.
National Corrugated Culvert Company, Middletown, Ohio.
National Lock Washer Company, Newark, N. J.
National Malleable Castings Company, Cleveland, Ohio.
O'Malley-Bearé Valve Company, Chicago, Ill.
Otto Gas Engine Works, Chicago, Ill.
Pennsylvania Steel Company, Philadelphia, Pa.
Q. & C. Company, New York, N. Y.
Ramapo Iron Works, Hillburn, N. Y.
Reliance Mfg. Company, Massillon, Ohio.
Remington Oil Engine Company, New York City.
Rhineland Machine Works Company, New York.
Richards-Wilcox Mfg. Company, Aurora, Ill.
Sellers Mfg. Company, Chicago, Ill.
T. W. Snow Construction Company, Chicago, Ill.
Spencer-Otis Company, Chicago, Ill.
Standard Underground Cable Company, Pittsburgh, Pa.
Stark Rolling Mill Company, Canton, Ohio.
Templeton, Kenly & Co., Ltd., Chicago, Ill.
Titanium Alloy Mfg. Company, Niagara Falls, N. Y.
Toledo Pipe Threading Machine Company, Toledo, Ohio.
Union Iron Works, Hoboken, N. J.
Union Switch & Signal Company, Pittsburgh, Pa.
U. S. Wind Engine & Pump Company, Batavia, Ill.
Verona Tool Works, Pittsburgh, Pa.
Western Electric Company, Chicago, Ill.
Wm. Wharton, Jr., & Co., Inc., Philadelphia, Pa.
Worth Wire Works, Kokomo, Ind.
Wyoming Shovel Works, Wyoming, Pa.

The new officers of the association are: J. R. Wyles, Detroit Graphite Company, president; N. M. Hench, Carnegie Steel Company, vice-president; John N. Reynolds, Railway Age Gazette, treasurer.

Metal Trades Convention in New York

Discussions of Papers and Reports
of Committees April 9 and 10

The programme has been prepared for the fifteenth annual convention of the National Metal Trades Association, which will be held at the Hotel Astor, New York, Wednesday and Thursday, April 9 and 10. The convention will open at 2 p. m. on Wednesday, following the serving of a buffet lunch at 1 p. m. At the first session the convention committees on credentials, resolutions, constitution, auditing and convention will be appointed and annual reports will be made by President Henry D. Sharpe, Treasurer Howard P. Eells and Commissioner Robert Wuest. Three standing committees will make reports at this session. The report on Industrial Education will be made by F. A. Geier, chairman; that on Apprenticeship by E. P. Bullard, Jr., chairman, and the third, on Systematic Compensation for Industrial Accidents, will be presented by Henry D. Sharpe, chairman. Each report will be followed by a discussion. The remainder of the afternoon session will be devoted to new business. The annual convention banquet will be held Wednesday evening.

At the morning session of April 10, which will convene at 9:30 o'clock, the following papers will be read, each to be followed by a discussion: "Luck, Law and Industrial Accidents," by William H. Doolittle, safety inspector of the National Metal Trades Association; "A Plea for Profit Sharing," by Maurice Barnett, New York; "Fire Prevention in Factories," by Lewis T. Bryant, commissioner of labor of New Jersey. At Thursday afternoon's session a paper on "Pension Plan" will be presented by William Lodge, Cincinnati, which will be followed by a discussion. The remainder of the closing session will be taken up by reports of committees, including that of the nominating committee through Howard E. Eells, chairman, and the election and installation of officers. In addition to the regular convention programmes a meeting of the Executive Committee will be held at 9 a. m. April 8, a meeting of the administrative council at 2 p. m. and the banquet of the past officers on the evening of the same day. A joint meeting of the local secretaries, presidents of the local branches and administrative council will be held at 9 a. m. April 9.

To Avert Railroad Strikes

Urging immediate action by Congress to protect the country from a railroad strike which would "paralyze commerce and bring hunger and misery to millions," the Railway Business Association, the national organization of manufacturers of railroad equipment, material and supplies, has issued a bulletin which advocates the strengthening at the extra session of the Federal arbitration machinery.

The Eastern conductors and trainmen, it is pointed out, will press demands following the conclusion of the firemen's case. "The Erdman act, through which until recently strikes causing interruption to train service have been almost wholly prevented, has all but broken down at the point where, mediation failing, arbitration was attempted in the large-scale dispute involving many roads at once." The act "should be amended forthwith or legislation substituted for it providing a form of voluntary arbitration so little open to valid objection as to deprive disputants of all reasonable excuse for declining arbitration under the law. To postpone remedial legislation is to invite widespread and perhaps national disaster at any moment."

Railroad managers and employees and the public are urged to "co-operate to obtain legislation which will place them squarely on the side of industrial peace and public convenience."

President Geo. A. Post says that though it is well understood that the scope of matters to be dealt with at the extra session is to be limited, action on this question would do much to reassure business, since "one acute cause of business anxiety at this moment is the fear that arbitration may break down and plunge large areas and perhaps the whole country into the chaos and disaster of a strike."

Sale of Thomas Motor Car Plant

An event of wide interest in the machinery and machine tool trade was the sale of the plant of the E. R. Thomas Motor Car Company at Buffalo last week. This sale meant the absorption of a huge aggregate of machine tools, machinery and equipment. It was conducted by J. E. Conant & Co., auctioneers, Lowell, Mass., who furnish the following statement regarding the proceedings:

"The remarkable interest manifested by the public from all parts of the country, and from Canada and England as well—first in the sale and now in the results of the sale—has appealed to the receivers of the E. R. Thomas Motor Car Company and to this office as of sufficient importance to take the time to make a somewhat extended report. The sale started promptly at 10 o'clock Monday morning, March 17, and went through the six days of the week right on schedule daily, finishing at 3.25 o'clock Saturday afternoon, March 22. The 'six thousand catalogued lots'—in lots to suit purchasers—were all disposed of without a single exception within the allotted time and on time. Lot No. 1 was purchased by C. A. Finnegan of the Empire Smelting Works, Depew, N. Y., for \$56,360, and Lot No. 2 by the Shiffman Iron & Metal Company, Detroit, Mich., for \$6000. The first day's sale realized \$84,500; the second, \$17,400; the third, \$72,200; the fourth, \$49,300; the fifth, \$11,300, and the sixth realized \$21,767. The aggregate for the six days was \$256,400.

"The registered daily attendance (and there were many who did not register) for Monday was 412; Tuesday, 387; Wednesday, 435; Thursday, 314; Friday, 220; Saturday, 201. The aggregate attendance per the 'sale register' for the week was 1969. By all connected with the sale the opinion is incontrovertible that it was unquestionably successful from beginning to end. Never in our experience, covering a period of over a century of continuous business, have we seen gathered at a sale at any one time in this country such numbers of business men—consumers and users."

A list of principal buyers furnished by Conant & Co. shows that the Thomas tools will be scattered all over this country and Canada.

New Plan of Sheet Mill Supervision

Recently the American Sheet & Tin Plate Company appointed assistant superintendents for each of the three turns at its Wellsville, Ohio, sheet mills and a number of other plants. It was found that when the day superintendent was ready to go off duty something would come up that would keep him until late in the night, and as this was not desirable the new arrangement was made and is said to be working out very satisfactorily. All the sheet and tin-plate mills of this company and the independent companies are working on a three-turn basis, and the demand for sheets is so urgent that several sheet mills have been working up to 12 o'clock on Saturday night for some time. The ordinary practice is for the first turn in sheet and tin-plate mills to go on shortly after midnight on Sunday, and the last turn finishes up early the Saturday morning following. The remainder of Saturday is utilized for changing rolls and making any necessary repairs, and all Sunday work is abolished where this is possible.

Allis-Chalmers Obstructions Continue

MILWAUKEE, Wis., March 25, 1913.—(By Telegraph.) Secretary of State Donald to-day refused a license to the Allis-Chalmers Mfg. Company, a Delaware corporation, to do business in Wisconsin pending further investigation. Application was made Saturday and a hearing was held this afternoon on complaint of attorneys for stock and bond holders who have made objections to re-organization plans on various occasions. Complainants say the new corporation does not comply with Wisconsin laws forbidding contracts in restraint of trade and the Secretary of State is holding up the license pending the establishment of his powers in the premises.

The Indiana Gas Company is constructing a retainer, to increase the capacity of its artificial gas plant at Muncie, Ind., to 2,000,000 cu. ft. daily. One hundred new coke ovens will be added.

Passing of the Bessemer Plant at the Königshütte

On November 5, 1912, the last heat was blown in the old Bessemer plant of the Königshütte in the presence of a distinguished gathering. The plant is to be torn down and will be replaced by a modern open-hearth installation. Engineer H. Illies has prepared a careful account of the early history of this well-known German mill which is published in *Stahl und Eisen* for February 6, 1913, and is of great importance to all interested in the early development of this process in Europe. Copies are given of the early official correspondence, and in particular of the report, dated March 16, 1857, on the results obtained in the first trials of the process, which were not successful, as the metal froze in the vessel. The matter then remained in abeyance until July 20, 1863, when the question of designing and building a plant was vigorously taken up, mainly due to a favorable report based on the opinions of the well-known Ritter von Tunner of Leoben. This report, which is very interesting, is also given in full. The plant is carefully described and illustrated by drawings. The first heat was blown January 25, 1865. From an official report dated February 5 it is evident that this heat was not blown quite enough; the next heat was overblown, and the third heat was similar to the first. However, the first heat was sufficiently good to enable a heavy shaft to be forged and tried out in a neighboring zinc rolling mill. No further heats were made until February 20, but in the meantime ingots were rolled to rails and plate that gave good results. A further report is given covering operations during 1865, when 38 heats were made. In 1866 only 21 heats were made, as each heat was very carefully worked up and tested. In 1867 the plant was used more, 426 heats being blown, and it is interesting to notice that arrangements were made to use the metal direct from the blast furnace. In 1875 a new plant was built, which is also illustrated, and in 1883 the first basic Bessemer heat was blown. The last acid heat was blown March 21, 1907, and, as mentioned before, the last basic heat November 12, 1912, thus closing a glorious chapter in the history of the Königshütte.

G. B. W.

Buffalo-Rochester Shops at Du Bois

The Buffalo, Rochester & Pittsburgh Railroad is doubling the capacity of its shops at Du Bois, Pa. The erecting shop is to be extended 250 ft., 137 ft. wide, and will then have a capacity for handling about 40 engines. The entire shop will be electrically driven and many new tools installed. An addition to the power house will double the present capacity, giving 2000 hp. It will be equipped with conveyors to handle all coal and ashes automatically. An extension to the boilermaking shop will be 150 x 200 ft. It will be electrically driven and will have three overhead cranes. A pattern shop will be built, 64 x 70 ft., two stories. A special building, 35 x 70 ft., will be erected for reclaiming scrap, by rerolling it from the usual railroad sizes of 2-in. round, 1 3/4 in. square or 5 1/2 x 1 1/2 in. flat into any sizes desired, by a system of rolls on a reclaiming machine, the rolls being changed for the different sizes. The company has also under consideration a steel car plant. Plans prepared call for a structure 192 x 400 ft., equipped with eight tracks and with the most modern tools.

The Harmet method of fluid ingot compression has been investigated at some length by the Prussian material testing station at Lichterfelde, near Berlin, Germany, and in the last annual report of the office are given some notes on experiments by Prof. E. Heyn and O. Bauer. A 3-ton ingot of about 0.3 per cent. carbon, about 0.7 per cent. manganese and 1.8 nickel was studied. An improvement was noted as a result of the process in that the compression prevented the formation of pipes which would give rise to seams after rolling.

The Deforest Sheet & Tinplate Company, Niles, Ohio, has recently installed a galvanizing kettle for the dipping of very small sheets, such as are ordinarily turned out in tin mill size, and also for the dipping of odd sized black sheets. In this way the galvanized edge is secured, whereas in galvanizing sheets in a large size and then blanking out, a raw or scale edge is left, which for many purposes is objectionable.

Stock Participation for Channon Company Employees

The stockholders of the H. Channon Company, Chicago, Ill., dealer in machinery and supplies, at a meeting called for April 10, are to ratify a proposal to increase the capital stock of the company from \$100,000 to \$1,000,000, 10 per cent. of which is to be divided among 25 employees who are either department heads or have been with the company over five years. The plan of giving the employees part ownership and a voice in the control of the company contains a provision that each year an employee holding stock may sell one-fifth of his stock to other stockholders, if he so desires, the remaining part of his stock to be held in reserve by the corporation officials. Should one leave the service of the company he is to sell his stock back to the stockholders, thereby eliminating the possibility of stock getting into the hands of outsiders. The Channon Company was established nearly 40 years ago and is owned by the Channon family, the members of which already have decided to share the business with their employees. The meeting of April 10 is therefore a formality only. In connection with the action of the company, its secretary, Harry Channon, has said: "If all employers would adopt such a plan we should soon see the end of war between capital and labor and unnecessary attacks on corporations."

New Carbuilding Plant in Nova Scotia

The plant of the Eastern Car Company, Ltd., at New Glasgow, Nova Scotia, is rapidly nearing completion. The power house is practically finished. Most of the machinery is installed, and the power plant will be in operation in about 30 days. The main building, which is 1100 ft. long, of four spans, each 90 ft. wide, is getting under roof, and much of the machinery is on the ground. From present indications the company will be fabricating car material within 60 days.

Horace H. Lane, of Detroit, Mich., consulting engineer, who has designed several carbuilding plants, including the one for the Haskell & Barker Car Company, at Michigan City, Ind., is constructing the New Glasgow works. H. B. Douglas, formerly manager of the Standard Steel Car Company at Hammond, Ind., and of wide experience in connection with other carbuilding works in the United States, has accepted a position with the Eastern Car Company as manager and is already on the ground getting his organization together.

A fireproof storage vault for tracings of drawings is in use by a Belgian institution, in which the storage arrangement comprises earthenware pipes, a few inches in diameter, set in a mass of concrete. Stamped steel covers are used for closing the tubes and for containing the information concerning their contents, such as a suitable numbering system. To avoid destruction in the event that water at a time of fire or for other reasons might get into the tubes, they are inclined slightly toward the opening to facilitate drainage. Tracings thus kept are reported to be in altogether satisfactory condition after four years of use, and this fact is attributed to the equable temperature which obtains.

The Institution of Automobile Engineers and the Society of Motor Manufacturers and Traders are to hold a joint meeting with the Society of Automobile Engineers of this country in June. The English party is to leave London May 17 and visit New York May 26 and 27; Pittsburgh, May 29; Indianapolis, May 30 and 31; Detroit, June 1, 2, 3 and 4; the succeeding three days on a steamer chartered for meeting purposes; Cleveland, June 8 and 9, and Buffalo, June 10, with the possibility that a number of visitors may stay long enough to visit Providence on June 11; Bridgeport and New Haven, June 12, and Hartford, June 13.

Nearly all the laborers and some of the skilled men at the plant of the Oliver Iron & Steel Company, Pittsburgh, are out on strike for shorter hours and higher pay and the plant is badly crippled in its operations. At a meeting of the strikers on Tuesday they refused to affiliate with the Industrial Workers of the World. Minor strikes have occurred at other Pittsburgh manufacturing plants in the past week but these have been settled.

Albany Lubricating Company 45 Years Old

In 1868 the firm of Adam Cook's Sons was founded at Albany, N. Y., as the Albany Lubricating Compound & Cup Company. The founder of the firm, Adam Cook, had given much thought to the problem of lubrication and attacked the problem from the point of making some change in the material itself rather than in the method of applying oil which was the lubricant then used to the bearings. After considerable experimenting on the combination of mineral and animal oils and grease, the compound which he called the Albany lubricating compound was produced. The name of this lubricant was changed, however, by the users to Albany grease and it has been known as this ever since. The first small plant in Albany was outgrown in four years and it was decided to move the business to New York City. Quarters were secured at 231 West street which it was thought would provide ample room for future growth. It became necessary, however, in 1881 to move to still larger quarters at 313 West street. After a number of additions had been made to this plant to meet the growing demand for Albany grease, it was finally decided that it would be better to concentrate the different departments and bring them all under one roof. Two years ago the West street plant was abandoned and the present commodious one at 708 Washington street placed in service.

Prices of Grooved Steel Skelp at Pittsburgh

The following table gives the prices of grooved steel skelp at Pittsburgh for the past five years, in cents per pound, averaged from weekly quotations in *The Iron Age*:

	1908	1909	1910	1911	1912
	Cents.	Cents.	Cents.	Cents.	Cents.
January	1.70	1.45	1.50	1.25	1.13½
February	1.70	1.45	1.50	1.30	1.11½
March	1.70	1.25	1.50	1.30	1.10
April	1.64	1.22½	1.50	1.30	1.11½
May	1.55	1.26¼	1.50	1.30	1.15½
June	1.50	1.30	1.50	1.27½	1.18¾
July	1.45	1.32½	1.50	1.25	1.22
August	1.45	1.36¼	1.48	1.20	1.25
September	1.45	1.40	1.41¼	1.18¾	1.28¾
October	1.45	1.45	1.35	1.15	1.36
November	1.45	1.51¼	1.25	1.13½	1.43¾
December	1.45	1.56	1.25	1.13¾	1.45

The price for January, February and March, 1913, was unchanged at 1.45c. for future delivery.

A large hot-water heater of the Kelley type, no less than 8 ft. in diameter and 12 ft. long by shell dimensions and capable of delivering 170,000 lb. of water per hour when supplied with exhaust steam, was installed some time ago in the plant of Winslow Brothers & Smith, Norwood, Mass. This information is forthcoming from C. L. Howes, M.E., New England manager, at 414 Atlantic avenue, Boston, of Benjamin F. Kelley & Son, manufacturers of heaters. The heater is therefore larger than the hot-water heater illustrated in *The Iron Age* of March 20. In the case of the Kelley heater a single pipe is run from the large exhaust main over the heater without any outlet other than a drip pipe from the lower head of the heater.

The Smith Gas Power Company, Lexington, Ohio, manufacturer of producer gas equipment, has had considerable inquiry for producers to replace oil for power and for the operation of small furnaces. The company is about to install two plants, one of which will replace oil at a glass-works, while the other will be employed for forging and heat treating in an automobile shop. It has recently brought out two new types of apparatus—a large mechanically operated producer for bituminous coal, which can be built in sizes of 1500 to 5000 h.p., and a new type of tar extractor, which is a marked departure from the apparatus heretofore used for this purpose.

The Chamber of Commerce, Chattanooga, Tenn., has issued a booklet giving information about the water-powers being developed, the industrial situation, the accessibility of points of historic and scenic interest and the desirability of Chattanooga as a place of residence. At the present time there are 300 factories representing more diversified products than any other Southern city, and a number of these are shown. The booklet contains a large amount of is supplemented by illustrations.

Cooper Engine Sales

The C. & G. Cooper Company, engine builder, Mt. Vernon, Ohio, reports much activity in the demand for steam and gas engines. It has recently received orders for steam engines as follows: One 32-in. and 56 x 60 in. tandem rolling mill engine for the Pittsburgh Crucible Steel Company, Midland, Pa., to drive Morgan continuous mills; one 30-in. and 54 x 60 in. single tandem rolling mill engine for the Wisconsin Steel Company, South Chicago, Ill.; one 18 x 42 in. heavy duty engine for the Woodruff & Pauch Stone Company, Columbus, Ohio; one 18-in. and 28 x 30 in. cross compound engine for the Delaware & Hudson Railroad Company, Oneonta, N. Y.; one 48 x 48 in. low pressure side for Grendel Mills, Greenwood, S. C. The company has also recently sold the following gas engines: Eight 21½ x 36 in. single tandem engines, driving gas compressor cylinders at the front end of the bed, which are to be installed in two pumping stations being built by the Ontario Gas Company, in Ontario, Canada; two 19 x 24 in. single tandem engines, driving two-stake air compressor cylinders from the front end of the bed, for B. B. Stroud, Bradford, Pa.

Coal from Greenland.—Although there are certain difficulties to be contended with, Greenland gives promise of becoming a somewhat important mining locality. Both the copper and coal mining industries are making progress there. From the mines of the Greenland Trading Company, a Danish Government institution at Umanok, enough coal was produced in 1911 to supply the wants of northern Greenland, so that there was no need of importing coal, and in 1912 the same mine was able to supply the three southern Greenland colonies with coal and a Norwegian steamer with 150 tons.

A carload of pig iron having mysteriously disappeared at Indianapolis, the Indiana Appellate Court has been called upon to decide a suit brought by the Upson Nut Company, Cleveland, Ohio, against the Home Stove Company, Indianapolis, and the Vandalia Railroad Company, after a judgment in a lower court relieving the stove company from liability and holding the railroad for the value of the iron. It was last known to have been on a siding outside the stove factory and was relieved of its contents over Sunday. The case has been returned to the lower court for a new trial.

Negotiations for the sale of the Pocahontas Coal Company's properties in the Pocahontas coal field of McDowell County, W. Va., are stated to have been completed by Michael T. Roach, of Charleston. The purchaser is the Lake Superior Corporation, Sault Ste. Marie. The consideration is said to be \$500,000, besides which the purchasing company has appropriated \$200,000 for developing work. Another mine will be added and the whole product will be shipped via the Lakes to be used in the by-product coke ovens of the Lake Superior Corporation.

The feasibility of the plan to furnish western New York with a gravity water supply from a reservoir to be constructed at Linden is discussed in a pamphlet which has just been issued by the State Conservation Commission, Albany, N. Y., and is liberally illustrated with colored plates, maps and cuts. The plans show Linden Lake, which will store 10,000,000,000 gal. of water, and will furnish two years' supply for the district.

The two new open-hearth furnaces under way for some time at the Vandergrift, Pa., works of the American Sheet & Tin Plate Company are now in operation. Both were built in record breaking time. No. 12 furnace was completed and put in operation in about seven weeks and No. 11 in about eight weeks. The new furnaces are of practically the same capacity as the old ones; they are rated at 35 tons per heat, but usually turn out slightly more.

The Machinery Markets

Manufacturers are still under pressure to fill orders booked in recent months and new ones which are coming in, though in diminished volume because of a quieter trend in buying. New York representatives describe their market as tending toward quiet, but with a fair amount of activity and practically all of the orders emanating from large and well established plants. In Philadelphia buying has continued rather quiet and almost entirely of small transactions. All lines of industry are reported as active in New England. The demand for machine tools for both domestic and foreign deliveries is keeping up in Cleveland. The export business is holding up well in Cincinnati also and straggling orders are being received from automobile makers and railroads. There has been no material change in Detroit, where conditions were reported as quieter last week, although a rather steady run of single tool sales has made a rather satisfactory total. Some railroad buying is anticipated in Chicago, where the business generally is well distributed and easily handled. Milwaukee shops are busy and behind in deliveries; in this city anxiety is growing as to the outcome of tariff legislation. Conditions are reported as fairly satisfactory in St. Louis and the indications for the future are regarded as favorable. The Central South demand for steam power equipment is excellent, and woodworking and conveying machinery is selling well, but the call for electrical apparatus has fallen off. Excessive rains have had a bad effect on trade in the Birmingham district, but the condition is a temporary one and the March volume of business is expected to be up to the average.

New York

NEW YORK, March 26, 1913.

Business was halted to some extent by observance of the Easter holiday, but despite this, trade was fair with the dealers and some moderately good orders have been placed with manufacturers' direct representatives in the machine tool line. Conditions tend toward quiet. It is noticeable that the orders placed of recent date invariably came from large and well established companies. Smaller firms, while they may make inquiries, are disposed to proceed slowly and buying for new enterprises is at a minimum. No really big deals of any kind are reported.

The sale of the machinery and equipment of the E. R. Thomas Motor Car Company, Buffalo, referred to elsewhere in this issue, developed many surprises. Contrary to expectations, dealers took comparatively few of the machine tools, as in almost every instance the prices obtained were far higher than they were willing to pay. One New York dealer remarked that at such sales all save experienced buyers seem to lose their sense of values. Another dealer remarked, facetiously, of course, that after the sale he hurried home to mark up the prices of his second hand tools. The high prices obtained for standard machine tools was one of the most surprising features of the sale. Examples quoted include a Brown & Sharpe vertical milling machine, first cost estimated at \$1500, which brought \$1250; a Cincinnati vertical milling machine, first cost also estimated at \$1500, which sold at \$1400; three American radial drills with 3 ft. arms, back geared tapping attachments, which sold at \$500 each, and a 22 in. Cincinnati upright drill, with tapping attachment, at \$300. On the other hand special machine tools sold at prices considered extremely low. They were most sought for by representatives of English firms. Two 21-in. Gisholt turret lathes sold for \$500 each, when their new cost was about \$1800. They were a few years old, however. Four 24-in. Gisholt turrets, which when new cost about \$2000 each, brought \$1125 each. Eight Fellows gear shapers went at prices ranging from \$850 to \$450, a dealer taking four at the latter price. Some Potter & Johnson machines went at too low a price also. The Wm. Cramp & Sons Ship & Engine Building Company and the Lake Torpedo Boat Company were large buyers.

The George F. Sealy Company, New York, will take over and continue the business and rebuild the plant of the Vance Boiler Works at Geneva, N. Y., which was destroyed by fire last December.

James Elgar, Inc., New York, has acquired the extensive plant with machinery and business of the McConnell Mfg. Company at Hornell, N. Y., manufacturer of doors, sash, etc., and will continue its operation. Benjamin F. Elgar is president and James Elgar treasurer of the new company.

C. Van Benthuyzen & Son, 407 Broadway, Albany, N. Y., will erect and equip a four-story and basement printing plant 68 x 90 ft., to cost \$50,000.

The J. P. Malcolm Company, Marion, N. Y., will soon commence construction work upon a one-story canning factory, 40 x 140 ft.

Bids are being received by the Akron Plaster Board Company, Akron, N. Y., for a one and two story factory building 66 x 150 ft., which it will erect this spring.

The Rome Wire Works, Rome, N. Y., is taking figures for a one-story addition 135 x 200 ft., which it will make to its plant at once.

A. E. Bonesteel, 313 River street, Troy, N. Y., is receiving bids through architect W. E. Clark of that city for a factory building 40 x 120 ft., three stories, to be erected this spring.

The Divine Tire Company, Inc., Utica, N. Y., has been incorporated with a capital stock of \$225,000 and will establish a plant for the manufacture of rubber tires, etc. B. H. Divine, C. W. Wicks and A. J. Eckert are the incorporators.

A two-story factory and warehouse of structural steel and brick is to be erected at Salamanca, N. Y., by T. P. Jones, 80 Front street, New York City.

H. D. Wood, Phoenix, N. Y., has plans in progress for a power house 30 x 40 ft., which he will build and equip at Clayville, N. Y., this spring.

The Syracuse Chilled Plow Company, Syracuse, N. Y., will make extensive alterations, improvements and additions to its plant at Wyoming and Marcellus streets at an estimated cost of \$200,000. The power plant and equipment will be changed to provide for electric drive.

The People's Ice Company, Syracuse, N. Y., will build an ice manufacturing plant on North State street, 31 x 142 ft., with wing 31 x 60 ft., and a power house 32 x 42 ft. The estimated cost of plant and equipment is \$35,000.

Henry Schmeer, 202 Noxon street, Syracuse, N. Y., is having plans prepared for a factory 50 x 100 ft., three stories, for the manufacture of boxes. It will be erected this spring.

The Enterprise Foundry Company, Auburn, N. Y., has commenced the rebuilding of its foundry which was recently destroyed by fire. The new structure will be 50 x 160 ft., one story.

The extensive additions to the plant of the Johnson Harvester Company at Batavia, N. Y., which have been under construction for some time are practically completed and installation of requisite machinery equipment will be made at once.

The Genesee Light & Power Company, Batavia, N. Y., will erect a steel addition to its power plant and install an electric traveling crane. The Easton Bridge Company, Easton, Pa., has the contract for the steel work.

The New York Air Brake Company is completing plans for the erection of a boiler house at its Pearl street plant, Watertown, N. Y.

It is stated the Leader Iron Works, T. E. O'Brien, vice-president, Decatur, Ill., has plans under consideration for a new plant to be erected at Oswego, N. Y.

The National Cigar Box Company, Binghamton, N. Y., E. Von Nostitz, general manager, has let contract for the erection of a cigar box factory 70 x 45 ft., four stories and basement, to be erected on Water street, that city.

J. F. Bishop, Binghamton, N. Y., will build and equip a three-story and basement planing mill 49 x 100 ft. Contract for the construction has been let.

The Niagara Radiator & Boiler Company, North Tonawanda, N. Y., has commenced construction of a 100 x 600 ft. structural steel addition to its plant at Ninth avenue and the Erie Railroad. The estimated cost of the new building and equipment is \$150,000.

The Shearston Mfg. Company, Lockport, N. Y., will

enlarge and remodel its manufacturing space and install additional machinery in the electric building foot of Race street.

The Beaver River Power Company, Beaver Falls, N. Y., has been incorporated with a capital stock of \$300,000 by A. S. Lewis, H. L. Van Ornam, Beaver Falls, and W. B. Van Allen, Carthage, N. Y., to build a plant at Beaver Falls for the development of electrical energy and for the manufacture of pulp and paper. The new corporation will also supply electric power to the present mill of the J. P. Lewis Company, Beaver Falls.

The Medina Woodworking & Furniture Company, recently incorporated at Medina, N. Y., has purchased the factory of the Medina Stamping Works and will re-fit it with up-to-date woodworking machinery. Carl H. Breed, president of the new company, was formerly a member of the hardware firm of Chase & Breed; J. William Jackson, formerly connected with the Maher Bros. Furniture Company, is vice-president, and J. Sylvester Thompson, formerly with the Swett Electric Company, secretary and treasurer.

The Ferguson Steel & Iron Company, Buffalo, recently incorporated, has completed plans for a one-story steel frame fabricating shop and electric crane runway to be erected on a site recently acquired at Bailey avenue and Stanley street.

Bids will be taken April 4 by Francis G. Ward, commissioner of public works, Municipal Building, Buffalo, for power heating and ventilating plants for the Masten Park High School, including boilers, pumps, gas engines, motors and generators. The estimated cost is \$100,000.

The V. W. Bonham Mfg. Company, 192 Chicago street, Buffalo, has been incorporated with a capital stock of \$20,000 to manufacture auto pumps and machinery. The company will have its product for the current year made by the Lake Erie Boiler Compound Company, Fulton and Chicago streets. Later it will equip and operate a plant of its own. The officers are V. W. Bonham, president; E. C. Swingle, treasurer and general manager, E. S. McCready, secretary.

New England

BOSTON, MASS., March 25, 1913.

The favorable impression as to future business continuance seems to increase in intensity. From every side, including practically all lines of industry, come reports of an exceedingly brisk demand. The great manufacturing centers of the New England territory agree in their hopefulness and in existing prosperity. Take for example the city of Providence, R. I., and its suburbs, all of which are built up on manufacturing industries, its mills and factories are having the best of business. The manufacturing jewelers are having a very good trade.

The wire industry has quite recovered from the slight slackening up of orders which was experienced a few weeks ago, and the mills are exceedingly active on new as well as for accumulated business. No unusual unrest has manifested itself as to labor. Wages appear to be slowly advancing as the natural result of an under supply of experienced workmen. The machinery dealers report a continuance of good business.

The plant and business of the Chandler Planer Company, Ayer, Mass., will be sold at public auction about the middle of April. The company was organized about 10 years ago to manufacture metal planing machines under the Chandler patents, which consist chiefly of a third belt drive which permits of a return speed for the table higher than had previously been applied in practice, the third belt furnishing a diminished rate of progress as the end of the stroke is approached. A considerable number of these machines were sold and were favorably received. Since 1907, however, the company has attempted but little manufacturing, and the sale is at the instance of the bond holders. The large shops have a wholly modern equipment. Another patent is for a clutch drive planing machine.

The Trumbull-Vanderpool Electric Company, Bantam, Conn., will erect a brick factory building 40 x 80 ft., three stories and basement. The structure will replace the works recently destroyed by fire.

The Scoville Mfg. Company, Waterbury, Conn., manufacturer of brass, will build an addition to its works, 125 x 160 ft., one story.

The John Swaine Iron Works, Springfield, Mass., plans to erect new works to consist of a four-story brick and steel structure 50 x 60 ft. The metal working equipment will be increased to take care of a growing business.

The new factory building of the C. J. Root Com-

pany, Bristol, Conn., will be 40 x 120 ft., three stories of brick mill construction.

W. A. Kinne, New Britain, Conn., will build a brass foundry 40 x 107 ft., one and two stories.

The business of the American Shear & Knife Company, Woodbury, Conn., which has gone into the hands of a receiver, will probably be reorganized, so it is stated.

The National Folding Box & Paper Company, New Haven, Conn., will erect an additional building 100 x 200 ft., five stories, of brick, heavy mill construction.

The plant of the Stamford Chemical Company, Stamford, Vt., was burned last week with a loss of \$25,000.

Additions to general manufacturing plants of New England include the following: J. J. Regan Mfg. Company, Rockville, Conn., addition 70 x 100 ft., two stories; Paul Whitin Mfg. Company, Northbridge, Mass., textiles, four-story addition, 50 x 70 ft.; Andrew Terry Company, Terryville, Conn., to reconstruct building for power house, with turbine water wheel and electric generator to produce 75 hp.; Renfrew Mfg. Company, Adams, Mass., large additions projected; Hallet & Davis Piano Company, Neponset, Mass., large brick and reinforced concrete factory building; Dwight Mfg. Company, Chicopee, Mass., five-story mill to replace existing structure.

The Rhode Island Branch, National Metal Trades Association, held its annual meeting March 13, when the following officers were elected: President, J. E. Osgood, J. M. Carpenter Tap & Die Company, Pawtucket; vice-president, A. J. Thornley, Narragansett Machine Company, Pawtucket; secretary, Joseph A. Holland, Providence; treasurer, John G. Aldrich, New England Butt Company, Providence. Executive committee, T. C. De Wolf, Brown & Sharpe Mfg. Company, Providence; E. C. Smith, Mossberg Wrench Company, Central Falls; E. A. Beaman, Beaman & Smith, Providence; D. K. Bartlett, Builders Iron Foundry, Providence.

The Pequonnock Foundry, Inc., manufacturer of grey iron castings, Bridgeport, Conn., will erect an addition, 34 x 100 ft., on property recently acquired opposite its main foundry.

Philadelphia

PHILADELPHIA, March 24, 1913.

Buying continues rather quiet, although a very considerable volume of small business is before the trade; large lists of tools, however, are scarce. A somewhat larger amount of new business is developing in boilers and power plant equipment. Prospects for an increase in special iron and steel mill equipment are considered favorable. The railroads continue unimportant buyers. Plant activities among tool builders have been fairly well maintained. Second hand machinery and tools are in fair demand. Machine tool salesmen report shop activities in the surrounding district as being comparatively good, although buying of new equipment is on a smaller basis. The trade, however, views the situation favorably and anticipates a continued moderate volume of business. The foundry trade is busy, particularly steel casting plants, which have received good orders for locomotive and car equipment castings.

The Trenton Engine Company, Trenton, N. J., has filed a petition in bankruptcy in the United States Court. The concern manufactured steam and gas engines. Its liabilities are scheduled at \$201,594 and assets at \$69,635. The company is not able to state what its future will be.

The A. & H. Foundry Company, Hamburg, Pa., contemplates adding a modern addition, 75 x 75 ft., to its present foundry. It will also erect a one-story warehouse for storage of finished materials and patterns. No additional mechanical equipment will be required.

William T. Barker, who operated the Bridgeton Iron Works, Bridgeton, N. J., which was destroyed by fire in December, 1912, has begun work on a new foundry building. The necessary equipment has been purchased and it is expected that the plant will be in running order by the middle of April. The main foundry building will be 90 x 110 ft.

The Louis J. Bergdoll Motor Company, Sixteenth and Callowhill streets, has been adjudged a bankrupt. Frank A. Harrigan has been appointed receiver. Liabilities are estimated at \$250,000 with assets placed at \$150,000. It is stated that the other plants in which the Bergdolls are interested, including the Bergdoll Machine Company, Bergdoll Motor Car Company, etc., are not involved.

Revised plans are in progress for the new car-

house and shops to be erected in Atlantic City, N. J., for which Stern & Silberman, Land Title Building, are the engineers. The proposed building is to be 187 x 390 ft., one and two stories of brick and structural steel.

C. C. Kempton & Co. have under consideration the erection of a six-story reinforced concrete factory building at Randolph and Vine streets. The building will be 27 x 103 ft. and is to be equipped with a power plant, elevators and modern factory facilities installed. An engineer will be selected in the week to prepare plans for the building.

The George W. Beabon Company, oil cloth manufacturer, has had plans prepared by Stewart A. Jellett, engineer, Franklin Bank Building, for a two-story brick power house, 79x85 ft., which is to be equipped with a battery of six boilers and other boiler room machinery. The contract for the building will probably be awarded this week.

A second hand hydraulic press, with a capacity of 200 tons or over, distance between columns two to three ft., is being inquired for by parties who can be communicated with by addressing Box 350, *The Iron Age*, Philadelphia.

Rehoboth, Del., has voted favorably on a bond issue of \$30,000 to be applied on the building and purchase of equipment of a municipal water plant. Proposed plans are for the sinking of artesian wells for the necessary supply of water.

The Big Savage Fire Brick Company, manufacturer of high grade fire brick, Frostburg, Md., is erecting an addition to its plant which will give it 80,000 sq. ft. of floor space and a capacity of 9,000,000 bricks per year.

Owing to its rapidly increasing business, the Flickinger Iron Works, Inc., manufacturer of gas engines and air compressors, Bradford, Pa., will erect a new plant and is now considering locations.

Chicago

CHICAGO, ILL., March 25, 1913.

The approach of the spring building season is being anticipated by a large number of manufacturers, who are preparing plans for additions to machine shops, foundries and their general manufacturing capacity. Already machinery manufacturers are taking orders in connection with this plant extension. This business, while it results in no exceptionally large individual orders, has the advantage of being well distributed and easily handled. Among the railroads the Minneapolis, St. Paul & Sault Ste. Marie has made an appropriation of \$25,000 for new tool equipment for the Chicago division and a list of requirements is understood to have been issued at Minneapolis. The Wabash purchases have not yet been finally completed.

The Hoyt-Noe Steel Company, Chicago, has been incorporated to engage in the manufacture of metal products with a capital stock of \$20,000. The incorporators are Thatcher W. Hoyt, 610 West Eighty-first street, Paul E. Noe and William G. Strong.

The Curtis-Ward Company, Chicago, has been organized with a capital stock of \$5000 to manufacture metal specialties by Frederick J. Ward, Birchwood station, E. E. Curtis and John C. Vroman.

The North Chicago Foundry Company, North Chicago, Ill., has been organized with a capital stock of \$50,000 by Charles H. Yeats, John Rouse and Stanley Bishop.

The Clipper Lawn Mower Company, Dixon, Ill., R. K. Orr, president, reports that its business in the first quarter of this year was the largest in its history for a similar period, and further extensions of its plant are contemplated.

The Forest City Machine Company, Rockford, Ill., will shortly reincorporate with an increased capital stock following the purchase of an interest by C. S. Spaulding. The business is to be expanded.

The International Molding Machine Company, Chicago, E. A. Pridmore, president, now operating in leased quarters on Western avenue, has taken out a permit covering the building of a two-story brick factory 50 x 124 ft. at 2616 West Sixteenth street to cost \$20,000.

The F. P. Smith Wire & Iron Works, Fullerton avenue, Chicago, has taken out a building permit to cover the erection of a one-story foundry 84 x 135 ft. to cost \$20,000.

The Western Felt Works, 4115 Ogden avenue, Chicago, will build a three-story factory 86 x 100 ft. to cost \$50,000.

The Calumet Baking Powder Company, 4100 Fillmore street, Chicago, will build a five-story factory 100 x 250 ft. to cost \$125,000.

W. J. Van Keuren, 128 North La Salle street, Chi-

cago, has completed plans for the erection of a one-story machine shop 50 x 125 ft. and a boiler house 19 x 26 ft., at Fillmore street and Forty-fifth avenue, to cost \$10,000.

The Bellwood Steel Company, Chicago, has been incorporated with a capital stock of \$180,000 by Frank Peska, 1539 North Hamlin avenue, M. L. Porter and S. B. King.

The Paragon Foundry Company, Forty-sixth and Grand avenues, Chicago, has placed the contract for a new building 110 x 120 ft. to cost \$25,000.

The molding machine business conducted at Chicago under the name of Henry E. Pridmore has been incorporated as Henry E. Pridmore, Inc., the capital stock being \$100,000 and the incorporators Emily M. Pridmore, Henry E. Pridmore and Charles H. Dummer.

The Eclipse Gas Stove Works, Rockford, Ill., is having plans prepared for the erection of a foundry 65 x 85 ft., increasing its capacity about one-fourth.

The Chicago Marvel Band & Press Company, Chicago, has been organized with a capital stock of \$50,000 by Jacob F. Jensen, Iva G. Wooden and William H. Bennett, to manufacture broom bands, presses, etc.

The Moore Mfg. Company, Waterloo, Ia., has been organized to engage in plate and sheet metal work of a general character. The capital stock authorized is \$10,000 and the officers are E. L. Moore, president and U. G. Kramer, secretary and treasurer.

The Valley City Machine Works, Grand Rapids, Mich., with which the Grand Rapids Machine Tool Company of the same city, was consolidated in January last, has purchased some new equipment and more is expected to be bought later. Extensions to the plant located 12-16 Campau avenue are also considered in the near future. The company manufactures milling machines, multiple spindle drills, woodworking machinery and grinding machinery.

The Zimmerman Steel Company, Lonetree, Iowa, manufacturer of stump-pullers, scales and converters, is erecting an addition to its plant which when completed will be 72 x 200 ft. New equipment will also be installed to double its present manufacturing facilities.

The J. A. Spencer Hay Press Company's plant at Dwight, Ill., was burned March 17 with a loss of \$100,000. It will be replaced at once, it is announced.

The Central Coin Controlled Locker Company, Belvidere, Ill., has increased its capital stock to \$150,000 and will equip a plant for the manufacture of its patented device.

Detroit

DETROIT, MICH., March 25, 1913.

No material change has occurred in the status of the machinery market, and as a whole March has seen business on a very even basis. The sales of single tools and small lots have been consistent and in sufficient volume to create a very satisfactory aggregate of business and dealers are far from being pessimistic. The inquiry for standard tools continues good.

A recent canvass of local firms engaged in the metal trades by a Detroit newspaper brings to light the interesting report that business is on a better basis than last year, nearly all the firms canvassed reporting an increase of production ranging from 10 to 50 per cent.

The spring elections to be held throughout the State April 7, at which a large number of propositions for the construction of or additions to municipal electric light and waterworks plants are to be passed upon by the voters, are causing considerable interest to the trade. Building operations are increasing in volume.

The Traveller Motor Car Company, Detroit, has purchased the two-story brick factory at 1146-48 Grand River avenue, and a tract of land adjoining, and is having plans prepared for the remodeling of the building and the erection of an addition on the vacant property. Additional equipment will probably be required.

The Standard Screw Products Company, Detroit, has been incorporated under Michigan laws, with a capital stock of \$50,000. The new company is stated to be a branch of a corporation of the same name operating in Pittsburgh and Milwaukee and has acquired a factory and warehouse, 90 x 166 ft., which will be remodeled to suit its requirements. William F. Evans and C. B. McDonald are named as the principal stockholders.

The Lozier Motor Car Company, Detroit, has increased its capital stock from \$3,000,000 to \$5,000,000 to facilitate the handling of its increasing business.

The former plant of the Peninsular White Lead Company, Detroit, has been sold to K. S. Morgan, representing a syndicate which will manufacture automobile parts. The plant is 125 x 250 ft., three stories, of brick construction.

S. DIESCHER & SONS.
Mechanical and Civil Engineers.

The public lighting committee of the Detroit City Council has allowed estimates calling for the installation of a new turbo unit with a condenser and other auxiliary apparatus at the municipal lighting plant, thereby increasing its capacity one-third.

The Swedish Crucible Steel Company, Detroit, has purchased a site of an acre and a half in Windsor, Ont., for a branch plant and will erect a building 60 x 125 ft., to cost about \$10,000, which will be used for the manufacture of steel castings.

The Vincent Steel Process Company, Detroit, has purchased a tract of three acres in Windsor and is having plans prepared for a branch plant to cost in the neighborhood of \$10,000.

The Michigan Mfg. Company, Detroit, has been incorporated with \$4,000 capital stock to manufacture brooms. Louis Stoll is the principal stockholder.

The Grand Rapids Forging & Iron Company, Grand Rapids, Mich., has been incorporated with a capital stock of \$30,000 to engage in the general metal working business. The incorporators are Christian F. Frey, Matthias Ruoff and Charles A. Hauser.

The taxpayers of Flint, Mich., have voted in favor of bonding the city for \$96,000 for the construction of a new sewage system.

The E. B. Gifford Mfg. Company, Adrian, Mich., has been incorporated with \$40,000 capital stock to take over an incorporated firm of the same name. The company manufactures hardware specialties and it is stated that the incorporation will result in the extension of the plant.

The Mead Cooperage Company, Saginaw, Mich., has been organized with \$10,000 capital stock to operate a factory for the manufacture of staves and heading.

Walter Steffens, Charles Klein and Fred Eberlein, Fraser, Mich., are interested in a company which is preparing to erect a brick making plant at that point. The plans call for a plant to cost \$35,000.

The taxpayers of Carsonville, Mich., have voted to bond the village for \$6,000 for the construction of an electric lighting plant.

The municipality of Reed City, Mich., has voted in favor of bonding for \$5,500 to provide for extensions to the present electric lighting system.

Earl Judd, Manton, Mich., has acquired the former plant of the Williams Bros. Company at that point and will operate a general woodworking industry.

The Sidnaw Handle Company, Sidnaw, Mich., has been incorporated with \$5,000 capital stock to manufacture implement handles. L. J. Tripp and B. C. Halstead, Mesick, Mich., are among those interested.

Cleveland

CLEVELAND, OHIO, March 24, 1913.

Machine tool builders report a good volume of orders, the demand being as heavy as at any time in the past few months. Both the foreign and domestic demand for automatic screw machines is heavy and a local builder is getting orders in excess of the output of its plant. The demand for cranes, hoists and other handling and conveying machinery is heavy. Some good-sized orders have recently come from Canada for conveying equipment for various purposes. Coal mining companies are buying quite freely. Foundry equipment is in very good demand. Local jobbing foundries are crowded with work and some are operating parts of their plants over time. Machine tool dealers, however, have experienced a decided lull in demand. Their sales have been light and new inquiries few, no lists of importance having come out.

The J. D. Smith Foundry Supply Company, Cleveland, is installing two core rooms in the plant of the American Malleables Company at Lancaster, N. Y. It has also taken an order recently for seven core ovens for the American Steel Foundries, at Sharon, Pa., and a repeat order for two ovens from the Muncie Foundry & Machine Company, Muncie, Ind. It is also preparing plans for an addition to the plant of the Medina Foundry Company, Medina, Ohio. It will be a building 45 x 90 ft., to be used as a cleaning department. The Smith company will furnish the sand blast equipment.

The King Bronze & Aluminum Foundry Company, 1730 East Thirty-seventh street, Cleveland, Ohio, is expected shortly to build a new brass and aluminum foundry on its present site.

The Henderson Foundry & Machine Company, Toronto, Ohio, has been incorporated with a capital stock of \$100,000 to do a general foundry and machine shop business and manufacture various products. E. L. Hen-

derson, Thomas Price, C. E. Wells and others are the incorporators.

The W. S. Bidle Company, Cleveland, has been organized with a capital stock of \$25,000 to establish a plant that will be devoted to heat treating steel, case carbonizing, hardening and tempering and the manufacture of several specialties. The company has purchased a site on East Forty-fifth street, on which it will shortly begin the erection of a plant. W. S. Bidle, who is at the head of the company, was formerly manager of the turnbuckle department of the Cleveland City Forge & Iron Company.

The Baltimore & Ohio Railroad is in the market for a car dumper to be installed at Lorain, Ohio.

The Fulton Pit Car & Mfg. Company, Canal Fulton, Ohio, recently mentioned as having been incorporated to take over the Fulton Pit Car Company, has completed its organization by the election of W. N. Meyers, president, and Harry Meyers, secretary. The company is building a new plant, which is expected to be ready for operation about August 1.

The Morgan & Marshall Co-operative Rubber Tire Company, East Liverpool, Ohio, which was recently organized with a capital stock of \$500,000, expects shortly to start a plant for the manufacture of automobile tires and other rubber goods. R. J. Marshall is president of the company and D. N. Cronin is secretary. The company has purchased as a site the Warner-Keffer pottery plant.

The Osborn Mfg. Company, Cleveland, has increased its capital stock from \$200,000 to \$500,000. This company has recently completed a large addition to its plant, which is used for the manufacture of molding machines. The increased capital will be used to extend its molding machine business.

The Nungesser Carbon & Battery Company, Cleveland, has increased its capital stock from \$100,000 to \$150,000. The company may decide to enlarge its plant a little later.

The Perfection Spring Company, Cleveland, has purchased a six-acre site in Toledo, Ohio, where it will build a large plant for the manufacture of automobile springs for the Willys-Overland Company of that city, near which company's plant the spring plant will be located.

The United States Automatic Company, Amherst, Ohio, will enlarge its plant by the erection of an addition 100 x 200 ft., doubling its present capacity. New machinery will be required. The company makes screw machine products.

The plant of the Metal Reversible Window Device Company, Fremont, Ohio, was sold by a receiver March 18, the building and personal property passing to W. A. Lucas. It is stated that the company will be reorganized and the business continued.

The Swinehart Tire & Rubber Company, Akron, Ohio, will erect a new three-story factory building 70 x 102 ft. to be used for the manufacture of pneumatic tires.

The S. & M. Tire & Rubber Company, Akron, Ohio, is planning the erection of a plant for the manufacture of its line of rubber goods, including automobile and bicycle tires. The company is considering locating its plant in Coshocton, Ohio.

The Nickel Plate Railroad will build a boiler shop 100 x 120 ft. in Conneaut, Ohio. The company states that it will probably not need new machinery, as the shop will be equipped with machinery from an old shop.

The American Range & Foundry Company, Cleveland, which has been engaged for a long time in the manufacture of stoves and ranges has decided to discontinue the making of stoves and will shortly begin the manufacture of small motors of 2 hp. and under. The company will continue its jobbing foundry business.

The Lake Erie Machinery & Supply Company, Cleveland, has secured the selling agency for the Cleveland territory for the line of milling machines, lathes and grinders made by the R. K. Le Blond Machine Tool Company.

The Advance Machine Company, Toledo, has increased its capital stock from \$80,000 to \$100,000. It is stated that some new machinery will be installed and that a little later the plant may be enlarged.

The National Rubber Company, Alliance, Ohio, expects shortly to place a contract for the erection of a new plant. The company has completed its organization by the election of George C. Russell, president and treasurer, and Milton Bejach, vice-president and secretary.

The United States Auto-Lock Company, Findlay, Ohio, has been organized with a capital stock of \$150,000. Harry Wendell is president, and E. B. Brokaw is secretary.

Wheeling

WHEELING, W. VA., March 25, 1913.

The Morgantown Machine Glass Company has been incorporated with a capital stock of \$150,000, to manufacture glass and a general line of domestic utilities. The company will take over the Wightman factory at Morgantown and eventually construct a string of factories in West Virginia towns. The incorporators are Fletcher Collins, George R. Kirk, W. A. Hermica, J. I. Arbogast, Thomas C. Weaver and Henry L. Collins, of Pittsburgh; Eugene Somerville and A. E. Means, of Grafton; Augustus Beehler, Leopold Sigwart, Charles F. Beehler, C. H. Maxwell, A. Y. Stenger, W. J. Wambaugh, L. J. Walls, B. F. Stone and W. A. Stenger, of Morgantown, and W. W. Willis, of Bridgeport, W. Va.

The Sparks Drilling Jar Company, Charleston, W. Va., has been incorporated with \$20,000 capital stock and the following incorporators: W. A. Ohley, C. W. Swisher, John L. Dickinson, Nobel Beattie and D. J. Clarkson, all of Charleston. A plant with a capacity of 10 drilling jars a day will be built at once for the manufacture of a patent of J. Sparks.

The plant of the Tri-State Drilling & Fishing Tool Company at Charleston, W. Va., which has been under construction three months, is nearing completion. The company will employ over 25 skilled machinists and plenty of work is expected as the plant is located in the center of a great oil and gas field.

A charter was issued to the Jeanette Light & Water Power Company, Anawalt, McDowell County, W. Va., to construct and operate an electric light plant, power and waterworks. The authorized capital stock is \$10,000 and the incorporators are R. L. Johnson, A. C. Davis, J. J. Stuart, Powell Short, W. C. Morris, G. M. Woody and J. S. Burks, all of Anawalt.

The Raleigh Realty & Construction Company, Beckley, W. Va., contemplates building a brick plant at that point, for which considerable machinery will be required.

Cincinnati

CINCINNATI, OHIO, March 25, 1913.

A number of straggling orders for machine tools are coming in from automobile and auto truck manufacturers, and this is practically the same condition of the railroad trade. The export business is holding up well, especially for this time of the year, and while one week may show a falling off, it is generally followed by a like period that is very encouraging. Manufacturers are taking a great deal more interest in the South American trade, especially since the visits of several leading machine tool builders to the Panama Canal. No change is reported by the second-hand machinery dealers. The jobbing foundries are all busy, and those making a specialty of railroad castings have about all the work they can handle.

It is rumored that the Scarborough Estate, Cincinnati, is having plans prepared for an eight-story power building, for small manufacturing purposes, to be erected at Broadway and Seventh street.

The New Idea Spreader Company, Cold Water, Ohio, is making a large addition to its plant, for which some machinery will be required. The company manufactures agricultural equipment.

The Lynn Superior Company, Cincinnati, manufacturer of bakers' machinery, is building an addition to its plant on Spring Grove avenue. Only a small amount of machinery and power transmission equipment will be required.

The People's Railway Company, Dayton, Ohio, has had plans prepared for some extensive additions to its power plant on Washington street.

S. M. Long & Son, Shelbyville, Ky., are fitting up a machine and blacksmith shop at that point.

The American Well & Prospecting Company, Corsicana, Texas, expects to commence work within the next 30 days on its proposed plant to be erected at Columbus, Ohio. Mention of this project was made several months ago.

The Brown Carriage Company, Cincinnati, will rebuild that portion of its plant recently mentioned as having been destroyed by fire.

The Sturm & Mattoon Carriage Company's plant at St. Paris, Ohio, was recently destroyed by fire. Nothing is known as to rebuilding plans.

The Valley Packing Company, 3673 Colerian avenue, Cincinnati, has had plans prepared for a boiler house addition 30 x 0 ft., one story, and of reinforced concrete construction.

The Standard Electric Tool Company, Cincinnati, reports a number of orders received in the past two weeks from European customers.

The Tool Steel Gear & Pinion Company, Station P, Cincinnati, Ohio, is planning to abandon its present quarters and move to a new building to be erected at Elmwood Place, not far from its present site. The land has been purchased and construction work will be started within the next month. The company has bought about \$20,000 worth of new machinery to be installed in the new works, and is not contemplating any further purchases at the present time.

It is quite probable that the city of Columbus, Ohio, will soon make some extensive additions to the municipal asphalt plant. Particulars as to machinery requirements are not yet available.

The American Foundry Company, Lexington, Ky., will build an addition to its plant that will be 66 x 80 ft., one story, and of brick construction.

The Superior Underwear Company, Piqua, Ohio, is making some extensive additions to its plant, for which special equipment will be required.

The East Ohio Sewer Pipe Company, Irondale, Ohio, has started work on a large addition to its plant, in which will be installed considerable new machinery.

The Hermann Gerstner & Sons Company, Dayton, Ohio, manufacturer of tool cases, will soon commence work on a new factory building at Cincinnati and Columbia streets. Its present quarters are on German-town street.

The Aluminum Foundry Company, Sebring, Ohio, is contemplating some extensions to its plant at that point. This company was recently purchased by A. C. Heacock and John S. Hotchkiss, both of Alliance, Ohio.

The Hoosier Stove Company, Marion, Ind., has let contract for a foundry addition to its plant that will be 100 x 140 ft., one story, of brick and steel construction.

Milwaukee

MILWAUKEE, WIS., March 24, 1913.

The only disquieting feature is the general situation in the machine tool manufacturing field is the probable action by Congress on the tariff. Outside of this the feeling is optimistic. Shops are busy and all available skilled help is in service. The Kearney-Trecker Company, West Allis, reports that it is getting further and further behind in deliveries as the result of increasing orders. It is doing much work for automobile and railroad shops, but most of the business is in small or medium-sized lots. The Kempsmith Mfg. Company reports a most satisfactory condition, while others in the same line are also well satisfied. The progress made in the reorganization of the Allis-Chalmers Company has helped to enliven the general situation.

The Wisconsin Electric Company, Racine, Wis., recently mentioned as having incorporated with \$50,000 capital stock, has leased about 15,000 sq. ft. of floor space in the Racine-Sattley carriage works, abandoned several months ago, and will engage at once in the manufacture of electrical labor-saving appliances. One hundred men will be employed at the start.

The superintendent of the Asylum for Chronic Insane, Milwaukee, Wis., will close bids April 9 for two steam boilers and two steam electric units. Specifications were prepared by Allan D. Conover, Madison, Wis., consulting engineer.

Edward E. Voss and William F. Filter have organized the Premier Machinery Company, Milwaukee, with a capital stock of \$10,000 and propose to establish a general machine shop. Mr. Filter is a well known capitalist and Mr. Voss has, until now, been associated with important machinery interests. The immediate requirements of the new firm will not be extensive.

The Sternberg Mfg. Company, Milwaukee, builder of motor trucks, is contemplating the erection of a large addition. Its plant was built only two and a half years ago, but is pushed beyond capacity. The company recently booked several large orders for trucks from the government of Venezuela. In celebration of the highly successful fiscal year just closed, the officers and directors tendered a banquet to the executive and administrative forces last week. William Sternberg is president, and Victor L. Brown is secretary and general manager.

Oscar Rademacher, John H. Ottmann and Fred Jones, of Milwaukee, are the organizers of the Perfection Appliance Company, Milwaukee, which has been incorporated with a capital stock of \$25,000. The concern intends to establish a small shop for the manufacture of mechanical appliances.

The Weber Mfg. Company, West Allis, Wis., has been incorporated with a capital stock of \$25,000. Those interested are John F., Joseph, Theodore and Anthony Weber. All have been associated with various machinery building enterprises for many years.

The Committee on Highways of the Milwaukee County Board has recommended the immediate purchase of approximately \$25,000 worth of machinery and implements for the construction of concrete roads. H. J. Kuelling, county commissioner of highways, Milwaukee, will act as purchasing agent.

The Department of Public Works, Milwaukee, Wis., is preparing a call for bids for furnishing and installing one pumping engine with a daily capacity of 12,000,000 gal., in North Point pumping station of the municipal waterworks system. The estimated cost is \$75,000. It is probable that before the end of the year a second additional pump, of the same capacity and estimated cost, will be purchased. The present capacity of the pumping engines is 96,000,000 gal. daily. Joseph A. Mesiroff is city engineer and F. G. Simmons is commissioner of public works.

Under a contract with the Chamber of Commerce, Marinette, Wis., the Aerial Cutlery Company, Duluth, Minn., manufacturing pocket knives, razors and other kinds of cutlery, will, on May 1, remove its plant and offices from Duluth to Marinette and occupy the former M. R. L. shop building in East Marinette. The building is now being remodeled, and equipment other than that to be brought from Duluth is being installed. The interests behind the company are divided between Duluth and Marinette. It was organized three years ago with a capital stock of \$25,000 by J. D. Phillips and T. M. Madden, of Duluth, and C. F. and F. H. Jaeger, of Marinette. The corporate name will be changed to Aerial Cutlery Mfg. Company upon removal.

The Bucyrus Company, South Milwaukee, Wis., will employ from 100 to 125 additional workmen as soon as the addition to the South Milwaukee works is completed. The work has been delayed somewhat by unfavorable weather conditions.

The Central South

LOUISVILLE, KY., March 25, 1913.

While the demand for steam power equipment appears to be excellent, judging from the number of orders reported by those in that line, the call for electrical apparatus has fallen off sharply. This is emphasized locally on account of the fact that a merger of central stations is in progress, and until this is completed there will be no certainty as to rates. Consequently manufacturers who have been debating using electricity instead of steam are holding off to wait permanent conditions. The call for machine tools has been rather light, but other special equipment, such as conveyors and woodworking machinery, is selling well. Elevators are also in good demand. The "efficiency" movement has made it easier to sell power plant specialties and devices for reducing transmission losses, dealers report.

The Transit Motor Car Company, Louisville, has changed its name to the Transit Motor Truck Company. It plans to increase its output, but will not need much new machinery, according to the manager, E. C. Walker.

J. B. Speed & Co., Louisville, have purchased the lime plant of the Eichel Lime & Stone Company at Milltown, Ind., and have installed some Webster screw conveyors purchased from E. D. Morton & Co. No other new equipment will be installed at present.

The Louisville Drying Machine Company reports that its operations have been interfered with by inability to get steel from the mills according to promise. The demand for its line is good, inquiries from Mexico, oddly enough, being numerous just at present.

Fairbanks, Morse & Co. have sold some of the motor equipment for the factory of the Speedway Tire Company, Louisville, through its local branch.

J. Schwarwalder & Co., Louisville, coopers, are planning the installation of a large number of electric motors during the next few months. The power plant has been recently enlarged by the installation of additional boilers and an engine and generator.

The Louisville & Nashville Railroad Company has purchased much of the equipment for its new creosoting plant at Guthrie, Ky., to which reference was made some time ago in *The Iron Age*. The contract for 10 tanks, with water-tube boiler equipment, has been let to the Henry Vogt Machine Company, Louisville.

The Lanham Hardwood Flooring Company, Louisville, will probably purchase new motors in the near

future, having decided to change the type of electrical equipment now in use.

E. D. Morton & Co., Louisville machinery dealers, report an excellent demand for Hyatt roller bearings.

The American Creosoting Company, Louisville, which has been taking bids on tanks and retorts for use in a new plant it is erecting at Indianapolis, has let the contract for several large storage tanks to the Henry Vogt Machine Company, Louisville.

The Louisville Point Lumber Company, 1132 Fulton street, Louisville, is considering the erection of an additional sawmill in Arkansas. Edward S. Shippen is president of the company.

According to a recent report, the Dix River Power Company, of which L. B. Herrington, head of the Richmond Electric Company, Richmond, Ky., is president, has let a contract for the construction of a dam across Dix River at Kennedy's mill. The station is expected to develop a capacity of 18,000 hp.

The Middlesboro Steam Laundry, Middlesboro, Ky., has installed a dynamo and other electric equipment, and will be in the market for supplies of that character from now on.

The Pineville Coal Mining Company, Harlan, Ky., will be in the market for power and coal mining machinery in about 90 days. R. W. Creech is president.

Business men of Paducah, Ky., are arranging to raise a fund of \$50,000 to be used to bring additional factories to the town.

William Weise, Maysville, Ky., has plans for the establishment of a large cold storage plant and abattoir in that city. Power and refrigerating equipment will be needed.

Augusta, Ky., is planning the installation of a waterworks system. The commercial club has been conferring with engineers regarding the plans.

The plant of the Terrell Distilling Company, Paducah, Ky., was burned March 17 with \$15,000 loss. Members of the company announced that it would be rebuilt at once.

Danville, Ky., is considering the enlargement of its waterworks plant, probably by the installation of additional pumps and laying down more mains.

The Nashville, Chattanooga & St. Louis Railroad, with general offices in Nashville, Tenn., is building a boiler house at Paducah, Ky., and will install power equipment for the operation of its machine shops and roundhouse there.

D. L. Goss, Borden, Ind., who is president of the Floyd Knobs Growers' Association, has details of plans for the establishment of a canning plant by the association.

The Yellow Poplar Lumber Company, which has a plant at Jane, Va., just over the Kentucky line, is to erect a new mill on McClure River, near that point, having recently acquired additional timber. The office of the company is at Coal Grove, Ohio.

William King, Harrodsburg, Ky., has the contract for the erection of a cold storage plant and ice factory for Smith & Brown, Harrodsburg, Ky.

It is reported from Nashville, Tenn., that the Harry E. Evans Company, Pittsburgh, Pa., which manufactures marine engines and high power turbines, has purchased a site on which will be erected a branch factory. H. L. Evans, Jr., will be in charge of the new plant.

The Louisiana Sawmill Company, Ltd., Alexandria, La., has been incorporated with \$600,000 capital stock and will build a large sawmill near that city. The company will install its own electric light plant. S. R. Lee is vice-president of the concern.

The Planters' Oil Mill & Gin Company, Kosciusko, Miss., is in the market for a 125 hp. Corliss engine. Used equipment will be considered.

Indianapolis

INDIANAPOLIS, IND., March 25, 1913.

The Industrial Lighting Equipment Company, Indianapolis, has been incorporated, with \$10,000 capital stock, to manufacture electrical lighting equipment and appliances. The directors are Felix Devere, F. M. Devere and Claude Shaw.

The Pumpelly Battery Company, Indianapolis, has been incorporated with \$20,000 capital stock, to manufacture electrical apparatus and vehicle parts. The directors are James K. Pumpelly, Harry Murphy and Sidney W. Elston.

The Van Camp Packing Company, Indianapolis, manufacturer of canned goods, will rebuild on the site of the factory destroyed several months ago. W. E. Ross, Dayton, Ohio, is preparing the plans. The foundation footings are 86½ x 248 ft., of reinforced concrete. It will be a fireproof structure of four stories.

Orlando S. Wagner has bought a controlling interest in the Franklin Galvanized Ware Company, at Franklin, Ind., and will make improvements to the plant.

Centerville, Ind., has voted an issue of \$6,000 in bonds for the installation of an electric lighting system.

The Amboy Commercial Club, Amboy, Ind., is at the head of a movement to obtain a waterworks system for the town.

The Crum-Wiley Mfg. Company, maker of brassware, will move from Decatur, Ill., to Peru, Ind., where a factory building is being erected for it. The company has been reorganized, with \$50,000 capital stock.

The Service Motor Car Company, Wabash, Ind., has increased its capital stock from \$125,000 to \$250,000.

The Schoentrup-Worden Rack Company, Shelbyville, Ind., has been incorporated with \$5,000 capital stock, to manufacture articles of wood. The directors are J. B. Schoentrup, George Worden and H. Minster.

The Orinoco Chair Company, Columbus, Ind., has been incorporated, with \$50,000 capital stock, to manufacture furniture. The directors are William H. Lincoln, John P. Sohn and Louis Bowen.

The Crawford & McCrimmon Company, manufacturer of hoisting and hauling engines, mine fans, pumps, etc., Brazil, Ind., will soon begin work on a new plant including a power house, forge shop, office, and engineering department.

Birmingham

BIRMINGHAM, ALA., March 24, 1913.

The excessive rains of the past ten days affecting business in the sawmill territory, as well as in several large construction enterprises, have had the effect of reducing the volume of business done by the dealers in machinery and machine tools. This condition appears to be only temporary, and March, as a whole, is expected to prove a satisfactory month.

The Ware County Light & Power Company, Waycross, Ga., has applied to the Georgia Railroad Commission for authority to issue \$180,000 of bonds, of which \$50,000 will be used for installing a steam turbine and a battery of three boilers.

The city of Abbeville, Ga., will hold an election on April 8 on the question of issuing \$8,000 of bonds for the establishment of a lighting plant. O. F. Beckman is Mayor.

G. Klink, Adam Schoeberlin and I. I. Goldsmith, of Aurora, Ill., and C. C. Farmer, Davenport, Fla., have organized a company to establish a lighting plant and an ice factory.

The city of Guyton, Ga., will vote April 15 on bond issue of \$15,000 for establishing a lighting plant. George P. Heywood is Mayor.

The St. Petersburg & Gulf Street Car Company, St. Petersburg, Fla., has awarded contracts for boilers to the Erie City Iron Works; to the General Electric for two generating units of 1000 kw.; and to the Westinghouse Electric & Mfg. Company for a 500 hp. rotary converter. R. E. Ludwig and H. C. Case have been engaged as engineers.

The city of Aliceville, Ala., has voted a bond issue of \$11,000 for the construction of a water plant.

The Brookwood Realty Company, Atlanta, Ga., will install a water plant on an 80-acre tract of land.

The Southmere Farms & Fruit Company, Titusville, Fla., will establish sawmills on a tract of 30,000 acres recently purchased. J. A. Klingsmith, Titusville; J. O. Clark, Philadelphia, and others are interested.

W. J. Gassett, proprietor of the Cabinet & Window Frame Works, is building a plant for the manufacture of sash, doors, mantels, show cases, etc.

Spawm's Food Product Company, Tampa, Fla., with a capital stock of \$100,000 has been incorporated to establish plants for the manufacture of food products. A. F. Spawm, John M. G. Watts, Judge C. B. Parkhill and Frank Cotton are interested.

C. C. Baggs contemplates establishing canning factory at Camilla, Ga., with a capacity of four to eight cars per day.

The Anastasia Concrete Company, St. Augustine, Fla., has been incorporated with a capital stock of \$40,000 to manufacture waterproof concrete block by F. E. Deming, L. L. Pickett, J. B. Harris and others.

The Waterman Company, Jacksonville, Fla., will be reorganized and its capital stock increased from \$25,000 to \$100,000. The present plant will be enlarged for the manufacture of banking and office fixtures. Adolph Waterman is president.

St. Louis

ST. LOUIS, MO., March 24, 1913.

While there has been no marked increase in the business of the machine tool market at this point, conditions are fairly satisfactory and the indications continue favorable for the coming months. Dealers generally are in a contented frame of mind, though they would be better satisfied if the increasing volume would come more rapidly. However, as the present tendency is still in the right direction there is little complaint. Collections are fair.

The St. Louis Board of Public Improvements will receive bids until April 4 for furnishing all the machinery, etc., necessary for the reduction of garbage for the city until September, 1918. The municipal assembly is also planning for the construction of a permanent municipal reducing plant and has passed a bill for the employment of an expert to prepare the plans.

Construction work has begun on the large power plant at Alton, Ill., which is to supply electric current for the East Side electric system. It will be a transformer station, the current being taken from the Keokuk hydroelectric plant.

The Standard Products Company, St. Louis, with \$200,000 capital stock, has been incorporated by H. Converse, Edgar Roberts and W. C. Shields and will equip a plant for the manufacture of drug preparations. It will also take over the plant of the Roberts Mfg. Company, of St. Louis.

The Thurman Vacuum Cleaning Company, with \$150,000 capital stock, has leased a factory building at Eleventh and Monroe streets, St. Louis, and will equip a manufacturing plant at once. Its present offices are in the Syndicate Trust Building.

The Louisiana Sawmill Company, Alexandria, La., recently incorporated with \$600,000 capital stock by S. R. Lee and others, has bought a very large acreage and will develop it, constructing and equipping a plant of 100,000 ft. daily capacity therefor. A railroad, a power plant and an electric light plant will be installed.

The Belt Coal Company, Blocker, Okla., has been incorporated with \$25,000 capital stock by James L. Brazell and Albert Belt, of Hartshorne, Okla., and R. P. Harris, of Fort Smith, Ark., and will put in equipment at once, it is stated.

An electric light plant is to be built at Corydon, Ky., by the L. H. Swanson Company, Evansville, Ind.

The Hazard Light & Power Company, Hazard, Ky., organized by W. E. Hemphill and others, will equip a steam power station to develop 240 hp.

The Southern Heat & Light Company, which recently purchased the Johnson plant at Jennings, La., will construct an addition to the gas plant facilities, will install an electric plant and will add two 60 hp generators. Engineer F. N. Litten is in charge of the work.

The city of Doniphan, Mo., has voted a franchise for the construction of an electric light plant and has placed the matter in the hands of the mayor.

A street lighting system, electric, is under consideration as a municipal matter at Webb City, Mo., the negotiations being in the hands of the mayor.

The Calvin Light & Fuel Company, Calvin, Okla., with \$40,000 capital stock, has been incorporated by J. W. Hundley, W. T. Anglin and Owen M. Murray, of Calvin, and Fred D. Oiler, of Tulsa, Okla.

W. P. Chapple, of Cleveland, Okla.; H. D. Bennett, of Independence, Kan., and J. R. Chapple, of Chanute, Kan., have incorporated the Cleveland Electric Company, Cleveland, and will equip a plant.

The Meridian Fertilizer Factory, main office at Meridian, Miss., will enlarge the plant at Shreveport, La., which is under the management of S. R. Jennings.

James Huggins, of Mulberry, Ark., is reported to have plans for the equipment of a feed mill at that place.

The Kingland Oil & Gas Company, Oklahoma City, Okla., with \$45,000 capital stock, has been incorporated by Charles E. King, J. H. Stewart and M. T. Tarman and will equip property controlled by them.

The Belmont Oil & Gas Company, Tulsa, Okla., with \$20,000 capital stock, has been incorporated by W. E. Hancock, George W. Ross and W. A. Stanborough to equip property controlled by them.

The flour mill of the Cordell Mill & Gin Company, Cordell, Okla., recently burned, will, it is announced, be rebuilt at once.

The Max Hunicke Chemical Company, St. Louis, with \$15,000 capital stock, has been incorporated to equip a plant for manufacturing specialty chemicals. The incorporators are Theodore J. Gisburne, C. E. Dederick and others.

The Hydro-Carbon Gas Company, New Orleans, La., with \$100,000 capital stock, recently incorporated by Leland W. Leonard, Billy Springer, Alfred Rose and others, will equip a plant for the manufacture of a patented hydro-carbon burner.

The Gardner Oil Company, Tulsa, Okla., of which E. D. Avery and others are the incorporators, is in the market for equipment for its property. Its office is at 1310 South Baltimore avenue.

The Truckers Ice & Cold Storage Company, Kenner, La., recently incorporated by A. Wattigny and Joseph and S. F. Cristina, has bought the Kenner Ice & Cold Storage Company's plant and will improve and enlarge it.

A band sawmill with 15,000 ft. daily capacity is to be equipped at Arkadelphia, Ark., by Robert O. James, of Indianapolis, Ind. Mr. James removes to Arkadelphia to manage the property.

The Vinson Arnold Company, Portales, N. M., is in the market for machinery for a large canning plant at that point.

The Omaha Tractor Engine Company, Omaha, Neb., has been organized with a capital stock of \$500,000, to manufacture tractor plows, gasoline and oil engines. The officers are: President and general manager, H. E. Johnson; vice-president, H. K. Burket; secretary and treasurer, I. Kahn.

The Century Electric Company, manufacturer of single phase alternating current motors and fans, St. Louis, Mo., is erecting an eight-story reinforced building which will more than double its present floor space.

Texas

AUSTIN, TEXAS, March 22, 1913.

While the losses from the recent cold spell were heavy replanting is rapidly going on and it is expected that the crop yields will not be materially affected as the season is still early. The demand for machinery continues good.

The Anderson Gin & Water Company will build a waterworks plant and cotton gin at Anderson.

H. P. Ball, of Detroit, Mich., and associates are arranging to erect a gas manufacturing plant and lay a distributing system at Bryan, Texas.

Mayor T. Coleman, of Sulphur Springs, is negotiating with a syndicate of Columbus, Ohio, for the building of a gas manufacturing plant and the laying of a distributing system at Sulphur Springs.

The Purity Ice Company will increase the capacity of its ice factory and cold storage plant at Marshall.

The Losley Motor Works, Cape Girardeau, Mo., contemplates establishing a branch factory in Austin. It manufactures motor engines.

The Austin Gas Light Company will build an addition to its gas plant at Austin that will add 125,000 cu. ft. daily to the present capacity.

The City Council of Texarkana will submit to a vote of the taxpayers the proposition of issuing about \$250,000 of bonds for municipal improvements.

The Southern Paper Company, Orange, has increased its capital stock from \$20,000 to \$40,000. It will make additions and improvements to its paper manufacturing plant.

The Marshall Electric Company, Marshall, has been organized with a capital stock of \$200,000. The incorporators are E. S. Fry, M. Turney and E. L. Wells, Jr. The same parties have organized the Marshall Ice Company, which has a capital stock of \$165,000. The two companies will build an electric light and power plant and a large ice factory.

The City Council of Rosenberg is arranging to erect a waterworks plant and construct a distributing system. It will also put in a modern sewer system.

The Timpson Light & Power Company will install a complete system of street lighting at Timpson and make improvements to its plant.

The San Antonio Gas & Electric Company will spend about \$100,000 in extending its gas mains and adding improvements to its electric lighting system at San Antonio.

Albert Steves and Ernest Steves will build a sash and door factory at San Antonio at a cost of about \$200,000. The plant will be equipped with modern machinery and the building will be of reinforced concrete. The plans and specifications for the proposed factory have been prepared by Leo M. J. Dielmann, architect.

The City Council of Bay City has arranged to increase the municipal water supply by boring another artesian well and adding more pumping machinery.

An irrigation district has been created near Bay City and bonds in the sum of \$60,000 were authorized for the

purpose of constructing the proposed system of irrigation.

J. W. Tompkins and associates will build an electric light and power plant at Kyle.

It is announced that about \$3,000,000 will be expended at Texas City in the present year in the construction of harbor improvements, the enlargement of docks and the erection of new buildings. The Texas City Transportation Company will make improvements to the wharf and warehouse system at a cost of more than \$1,000,000, it is announced. The federal appropriation for the improvement of the harbor at Texas City available for the present year is \$1,400,000.

Rudolph A. Bender, of San Antonio, and associates are arranging to establish a brewery at Brownsville.

The Hatch Byrne Company, San Antonio, has been organized with a capital stock of \$40,000 for the purpose of mining sand and gravel. It will install considerable machinery. The incorporators of the company are H. J. Hatch, E. A. Byrne and Edward Case.

The Bremond Southeastern Coal Company will open up a large lignite coal mine near Bremond, and will install considerable machinery.

The American Smelting & Refining Company has adopted plans for greatly increasing the capacity of its smelter at Chihuahua, Mexico, and they will be carried out as soon as peace is restored.

The Pacific Coast

SAN FRANCISCO, CAL., March 18, 1913.

A few fairly large individual inquiries for machine tools have appeared of late, as the more important interests are carrying out improvements contemplated for some time, but a slight curtailment is noted in the ordinary class of small orders. There is an abundance of inquiries, but crop conditions are so uncertain at the moment that purchases are being delayed. If plenty of rain falls in the next few weeks there is no doubt that most lines will be very active. The possibility of adverse legislation is causing delay in the placing of orders in several specialized lines of machinery, as well as machine tools, as several objectionable measures have been introduced in the State Legislature. Among these are the extension of the eight-hour law to apply to men as well as women, a new employers' liability law of very drastic character, a minimum wage law and a law which would practically prohibit gold dredging. Many large inquiries are coming out for laundry machinery, but only a very small part of the prospective requirements is being ordered now. Equipment orders for mining and construction work are coming out well, with especially favorable prospects in Nevada and Arizona. Dealers in logging equipment also report a very heavy business, both in California and the north, and there is a little more movement in mill supplies, though few planing mills are buying as yet. Pumping machinery of all descriptions is in strong demand, and business is expected soon from several large irrigation projects.

The Southern Pacific Railroad is still in the market, the latest list including a double-end hydraulic wheel press, a heavy bolt cutter, a large turn-table lathe, an 18-in. brass lathe, a 30-in. shaper, etc.

The Pacific Gas & Electric Company has placed orders on a good sized list, dividing the business between several firms.

No direct information has been obtained here from the West Coast Iron Company regarding its proposed plant in this city, but inquiries have been made for structural steel for its building, and it is reported that two open-hearth furnaces are to be installed. The impression prevails that the plant will be of an experimental nature, the site being too small for production on a large commercial scale. H. W. Lash, 1007 Williamson Building, Cleveland, Ohio, is president and general manager of the company.

Plans have been made to build a cyanide plant at the Sovereign mine, near Sierra City, Cal.

F. Madaugh and C. O. Silverstein have been taking figures on a gold dredging outfit to be installed near Igo, Cal.

The Pacific Lumber Company will start work shortly on a new planing and woodworking plant at Scotia, Cal., where the company now has one of the largest sawmills in the state.

R. Warren Phillips has bought out the interests of L. E. and A. B. Phillips in the Phillips Iron Works, Los Angeles.

H. J. Eifler is building a machine shop for general work at Imperial, Cal.

The city of Los Angeles is contemplating a lot of harbor and grading work, the estimated machinery requirements of which include two steam shovels, four locomotives, forty-two dump cars and repair shop equipment. Figures are being taken on the steam shovels.

It is reported that the Pacific Quicksilver Company will install a lot of power and ore-handling equipment at Dos Palos, Cal.

The Fuller Shoe Company has let contracts for the construction of a large factory at Torrance, Cal.

The Coronado Fruit Packing Company, Coronado, Cal., plans to spend about \$20,000 for machinery this spring.

The city of Sacramento, Cal., is having estimates made on a 50-ton municipal ice plant.

The Lodi Electric Appliance Company is working on a project to start a factory at Lodi, Cal.

The Golden West Motors Company, Sacramento, Cal., has been incorporated by W. H. and I. Williams, K. M. Robinson, H. and G. Breniser.

The Sterling Fixture & Show Case Company, now located in Oakland, is figuring on putting in a plant at Richmond, Cal.

Eastern Canada

TORONTO, ONT., March 22, 1913.

There is no evidence of any change for the worse in business. On the contrary, it seems to be not only keeping at high record level but still going up. But there is uneasiness on financial account. There are fears of a money pinch much more severe than that now being experienced and which has not yet given any trouble to manufacturers. The spring starts auspiciously, unless one takes as adverse the wind storm of Good Friday, that did much havoc and caused loss to many manufacturers.

A company, of which Thomas Hall, Henry Ashworth and William Thomas, all local men, are practical members, has been formed in St. Thomas, Ont., to carry on a machine shop business there.

The Dominion Government has awarded the contract for 15 locomotives to the Canada Locomotive Company of Kingston, Ont., for the Intercolonial Railway. Ten of these engines will be of the consolidated type and five will be switch engines. Work will be commenced as early as possible.

Fred Blackington, of Chicago, has entered into an agreement with Chemicals, Ltd., Welland, Ont., to take over the property and to erect a plant. The product to be manufactured will be similar to that intended to be turned out by Chemicals, Ltd. The plant of the latter company was not built because of the fact that the man who was financing the company died shortly after its organization. The new concern will reduce iron ore by an electrical process and manufacture a standard product. The parent company is located in Chicago. The company has a site of 35 acres and plans for the Welland plant are completed and the contract will be let as soon as the by-law which is to be submitted to the ratepayers of Crowland, fixing the assessment of the company, is carried. The charter for the new company has been applied for and the name will be announced when it is granted. It is expected that the plant will be in operation by October 1. After the by-law has been voted on the work will be rushed with all possible speed. A contract has been closed with the Ontario Power Company to supply the needed electrical power. Chemicals, Ltd., has a site of 35 acres.

Preparations are being made to carry out plans for the construction of machine shops at North Bay, Ont., by the Canadian Pacific Railway Company at an expenditure of \$250,000. Work will begin at once, as all the preliminaries have been completed and appropriations made. It is estimated that the new additions to the C. P. R. industrial activities at North Bay will add from 100 to 200 employees to the payroll, a good many of these being skilled mechanics.

The T. & N. O. Railway Commission is reported to have plans out for the construction this summer of shops and yard extensions at North Bay calling for an expenditure of approximately \$350,000.

Two New York representatives of the United States Steel Corporation, H. Coulby and W. P. Palmer, visited the site of the new Steel City on Detroit river, near Sandwich Saturday, and approved definite plans toward laying out the new city. The first mill to be established is to be a wire mill, and the location of this mill, as well as the docks, was decided upon. Construction work will be started in the spring.

The New Brunswick Government stands ready to give assistance in the establishment of a great ship-

building plant at St. John. A series of resolutions giving the Government authority to grant such aid were unanimously adopted by the legislature last week. A significant statement was made in the course of the debate by Hon. Mr. Grimmer, who said he felt free to tell the house and the country that the Canada Iron Corporation was seriously considering the removal of its immense foundries and blast furnaces from London-derry to a place where they would be more closely associated with a big shipbuilding industry, and St. John offered excellent opportunities for the work they had in mind.

A by-law is to be submitted to the ratepayers of Goderich, Ont., to loan the Rice-Knight Mfg. Company \$20,000, which proposes to erect a plant and 50 dwellings for employees.

The Montreal Tramways Company will spend more than \$2,000,000 in improvements.

The Foundation Company, Ltd., now has nearly 100 men at work on the site of the new sugar refinery at St. John, N. B., and the number will be increased just as soon as the weather becomes milder. Satisfactory progress is being made.

The New Brunswick Hydro-Electric Company, St. John, N. B., announces that it will proceed with the development of power at a point 50 miles away from the city, where works will be put in for the production of from 15,000 to 20,000 hp.

The Private Bills Committee of the Ontario Legislature has passed the bill to incorporate the town which the United States Steel Trust proposes to build on 1650 acres of land in Essex County, on the Detroit River, and call Jibaway. At present the site has a population of three persons.

The roof was blown off the Garden City Paper Company's mill at St. Catharines, Ont., March 21.

Fire damaged the Robert Elder Carriage Works, at the corner of Soho and Phoebe streets, Toronto, to the extent of \$3,300, March 21.

Announcement has been made by Hon. Adam Beck that the Hydro-Electric Commission, Toronto, will at once advertise for tenders for the construction of the transmission line from Dundas to Windsor. The cost of the extension will be several million dollars, and all towns along the line, including St. Thomas and Chatham, will be supplied with cheap electric power. It was announced also that the commission will at once call for tenders for the material for the construction of lines from Cannington to Beaverton, from Berlin to Elmira, from Clinton to Goderich and from Brantford to Paris. This material, it is expected, will cost \$2,000,000.

Severe damage was done by the storm at the plant of the London Concrete Machinery Company, London, Ont. On two sides were the buildings of George White & Sons. At the latter plant the only damage was to windows, but the concrete machinery plant was in a pocket of the cyclone, and the roof of the warehouse was lifted off.

An industry which is practically new to Canada has been founded in Toronto by the Benedict Mfg. Company of Syracuse, manufacturer of silver plate, bronze, brass and metal goods, novelties, clock frames and jewel cases. The Canadian company will be known as the Benedict, Proctor Company, Ltd., and will have a capital stock of \$25,000. The company has secured a factory at 32 Church street, and machinery is now being installed. L. G. Proctor, of Toronto, who is president of the Canadian company, is superintending the opening of the new plant.

The Massey-Harris Company has purchased the entire capital stock of the Deyo-Macey Engine Company, of Binghamton, N. Y. The Massey-Harris Company has been selling engines for some years manufactured by a company in the United States. It has, however, had in view ultimately manufacturing engines itself in Canada. To carry out this intention it has secured this going concern, and expects within the present year to build a new factory specially designed for engine construction in Canada.

The Chicago Bridge & Iron Works has purchased seven acres of land for a Canadian plant, at Bridgeburgh, Ont., across the Niagara River from Buffalo. A temporary building 60 x 100 ft. is being erected to be in readiness for operation May 15. Later, permanent buildings will be erected. The plant will have Grand Trunk Railroad and Michigan Central Railroad switching facilities. C. C. Gregory is manager.

Plans are being prepared by the Michigan Central Railroad for a machine shop and power house to be erected at St. Thomas, Ont., to cost approximately \$150,000.

The W. E. Dillon Company, Toronto, manufacturer

of sheet metal goods, has plans completed for a four-story factory which it will erect on George street.

The Steel Bending Brake Works, Chatham, Ont., has been incorporated with a capital stock of \$35,000. The company will engage in the manufacture of metal brake machines. Herman K. and Walter H. Dreis and Nicholas Krump are the incorporators.

Western Canada

WINNIPEG, MAN., March 22, 1913.

The industrial outlook in western Canada is not very encouraging at the moment. The financial stringency is affecting the situation, and everything seems to depend upon whether the European troubles will be settled in the near future or not. While the banks and the loan companies here are looking after the requirements of the business men, there is a scarcity of capital to allow industries to carry into effect the expansion programmes they contemplated for the season. There is, however, a fairly good demand for machinery, and the local houses have some substantial orders on their books.

The Town Council of Yorkton, Sask., is arranging to raise \$100,000 for the construction of a waterworks plant.

It is reported that the Grand Trunk Pacific Railway Company will install a power plant in Regina, Sask., to supply power for its station there, and for the hotel which it is proposed to erect in the near future.

The Cariboo Timber Company will erect a lumber mill at Fort George, B. C., as soon as navigation opens. It will have a capacity of 25,000 feet per day.

It is reported that the Great West Iron, Wood & Chemical Company, Ltd., Prince Albert, Sask., has decided to establish a plant at Medicine Hat, Alberta, for the manufacture of car wheels and structural iron and steel.

A. L. Irish, president of the National Sales Corporation, Cincinnati, has been in Moose Jaw, Sask., in the interest of a large United States flax mill company which is planning to build a flax mill there.

The Canadian Fish & Cold Storage Company, Ltd., Prince Rupert, B. C., is erecting a fertilizing plant. The company has a cold storage plant that cost about \$1,000,000.

The J. J. MacLean Lime Company, Young, Sask., will double the capacity of its plant.

Harry Stephens, Portage la Prairie, Manitoba, contemplates establishing brick-making plants at Edmonton and Calgary, Alberta.

The Medicine Hat Radiator Company, Medicine Hat, Alberta, recently organized, will start at once on the erection of the first building of its plant, which will be 90 x 300 ft. Corey Wright, Sauk Centre, Minn., is one of the organizers and has charge of the purchasing of the equipment, which will include lathes, drill presses, boring machine, thread cutting machines, cupola, overhead trolley and ladles.

The Railway Accessories Company, Seattle, Wash., manufacturer of railway supplies, will build its Canada factory in Moose Jaw this spring. The company has a capital stock of \$100,000.

The Frampton Soap Company, Seattle, has decided to open a factory in Moose Jaw and will build in the early spring. Its capitalization is \$100,000.

The Imperial Iron & Steel Company, an American corporation, will establish at Prince Albert, Sask., a plant for the manufacture of bar iron and horseshoes on 30 acres of land given it for that purpose. The plant will be in operation in about eight months. The buildings to be erected comprise two 80 x 126 ft. each, one 40 x 50 ft.; one 60 x 80 ft.; one 80 x 200 ft., and one 25 x 60 ft.

The Canada Car & Foundry Company is installing in its Fort William plant three 600 kw, 60 cycle, 3-phase, 500 volt a.c. generators, driven by producer gas engines, and it is claimed that this will be the largest producer gas engine plant in Canada. The engines are being supplied by the Mesta Machine Company, Pittsburgh, Pa., and are of the single tandem, horizontal, double acting, 4-cycle type, cylinders 28 in., diameter by 36 in. stroke, to operate at a speed of 150 r.p.m. The main gas plant consists of four double bituminous coal generator sets furnished by R. D. Wood & Co., Philadelphia, Pa.

Ten acres in Chamberlain Place, Weyburn, Sask., have now been selected by the J. I. Case Threshing Machine Company, of Racine, Wis., as the site for operating points for western Canada. The plans of the company contemplate an early start on the new buildings, which should be practically completed by the close of the year.

Trade Publications

Boring, Milling, Drilling and Tapping Machine.—Rochester Boring Machine Company, Rochester, N. Y. Circular. Treats of a floor type combination boring, milling, drilling and tapping machine which was illustrated in *The Iron Age*, December 5, 1912. Front and rear views of the machine are given, together with a condensed specification table for the ten different sizes and a complete description. In addition to the standard machine the length of column, column runway, spindle or floor plate and the range of speeds and feeds can be varied to meet special requirements.

Roofing Tin.—Follansbee Brothers Company, Pittsburgh, Pa. Two pamphlets. Refer to the manufacture of Scott's extra coated roofing tin and give a number of illustrations of the manufacturing processes, as well as structures covered with it. A standard roofing specification and drawings showing the various stages in the forming of flat and standing seams are included.

Wrench for Round Head Bolts.—Ambler, Holman & Co., 565 West Washington boulevard, Chicago, Ill. Folder. Lists the various uses to which the Eagle Claw wrench which was illustrated in *The Iron Age*, December 5, 1912, can be put. These include the holding of a round head bolt by the head to prevent it from turning while unscrewing the nut, as a plier for holding round, square, oblong, hexagon and other shaped objects; for turning a pipe and for taking off caps that are flush with a wall. A description of the wrench is given, together with illustrations showing the way in which the several operations listed are performed.

Mining and Contractors' Equipment.—Wm. J. Oliver Mfg. Company, Knoxville, Tenn. Catalogue. Size, 6½ x 9¼ in.; pages, 80. Gives general description and specifications for a complete line of mining and contractors' equipment. This includes dump cars of various types and sizes, flat and ballast cars, mine and cement tipples, sheaves, track rollers, shaking screens, tracks, fans, derricks, hoists and hoisting engines and rope. A table of contents and an alphabetical index are included so that any desired article can be found readily.

Bearing Metals.—A. Allan & Son, 486 Greenwich street, New York City. Folder. Refers to the Allan metals which are lead-copper alloys, with and without tin, made by a special process. These metals are red metal, a lead-copper alloy, and the Allan bronzes in which the lead content is controlled. The bronzes are made in several grades, according to the service for which they are specified. Both metals are sold in castings and ingots.

Power Press.—Rockford Iron Works, Rockford, Ill. Two folders. Illustrate and describe a manufacturing power press which is built in five sizes, one for foot operation and four for a belt drive, and a patented automatic brake which is supplied for the press. Illustrations and brief descriptions are given, together with a condensed table of specifications of the various sizes of presses. An illustrated description of the flywheel type of press appeared in *The Iron Age*, December 5, 1912.

Turbo-Generating Sets.—B. F. Sturtevant Company, Hyde Park, Boston, Mass. Mailing card. Deals with a line of turbo-generators which are built in sizes ranging from 5 to 75 kw. The advantages claimed for these sets are that they provide simple and compact lighting and power units for shops and do not require a licensed engineer to run them.

Allegheny Iron Sheets.—Allegheny Steel Company, Pittsburgh, Pa. Folder. Describes Allegheny iron sheets. Tables are given, showing maximum lengths and widths rolled by the company and other valuable information for the users of sheets is embodied. In addition to sheets, the company produces tank plate and boiler tubes of Allegheny iron, charcoal iron boiler tubes, and open-hearth steel tank plates, boiler tubes, sheets, castings and hot pressed stampings.

Engine Lathe.—Willard Machine & Tool Company, Cincinnati, Ohio. Circular. Relates to a 13-in. engine lathe which by removing the filling piece in the bed can be used to accommodate work 21 in. in diameter and 6½ in. wide. An illustration of the lathe is given together with a brief text description and a table of specifications. *The Iron Age*, December 5, 1912, contained an illustrated description of this lathe.

Vertical Centrifugal Pumps.—Goulds Mfg. Company, Seneca Falls, N. Y. Bulletin No. 114. Deals with a line of vertical, single-stage centrifugal pumps which are built in a number of different sizes. A brief description of the pump is given followed by tables of capacities, power required and dimensions.

Monorail Track Switch.—Shaw Electric Crane Company, Muskegon, Mich.; Manning, Maxwell & Moore, Inc., 85 Liberty street, New York City, selling agent. Bulletin No. 73. Devoted to the fixed tongue type of monorail switch which was illustrated in *The Iron Age*, December 5, 1912. The special feature of this switch is that there are no moving parts so that the trolleys can run through the track switch in all directions without stopping, and at the same time there are no open ends of track to be guarded so that the danger of the trolley falling to the ground is eliminated. Illustrations of the switch as installed in a number of plants serve to supplement the description and tables of dimensions and capacities are included.

Metal Sheets.—Newport Rolling Mill Company, Newport, Ky. Calendar. Announcement is made by this company that its 1913 calendar will be ready for distribution on March 31.

